EKISTICS

HOUSING AND PLANNING ABSTRACTS

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ΟΙΚΙΣΤΙΚΗ

MARCH 1958

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E K I S T I C S

HOUSING & PLANNING ABSTRACTS

DOXIADIS ASSOCIATES
Consulting Engineers
10 Venizelou Street
ATHENS GREECE
Tel: 28857 - 31604
Cables: DOXASSOC

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EDITORIAL

Material for each number of Ekistics is not collected upon any pre-arranged plan but is selected from current published articles or contributions sent by Ekistics correspondents - whether research stations, university departments or United Nations Technical Experts in the field.

It happens sometimes, however, that a main theme will tend to dominate a particular issue, and in this case it has undoubtedly become the theme of standardization: ranging from the standardization tests for earth block construction to the standardization of recording data on housing surveys.

In the housing field standardization is handled in several interesting and rather unexpected ways. Description of the systematic use of a standard module in the construction of house parts comes from central Africa. The results of systematic inspection of about half the experimental houses built at the New Delhi Housing Exhibition of 1954 gives a more scientific basis to some standards for housing in tropical countries, notably their finding that, provided the roof is well insulated, variation in ceiling heights (even under the trying conditions of the Delhi climate) had no measurable effect on comfort.

At the other extreme, two descriptions are given of efforts to introduce the "assembly line" house in the USA: the first an interesting experimental house by George Nelson, which takes into account both the requirements of mass production and that headache of the "prefabricated" house - the problem of the economic distribution of its bulky components. The second article on the success of "mobilehomes" in the USA illustrates one way in which the problem of distributing the prefabricated dwelling has been partly overcome - though not very satisfactorily from an urbanistic point of view. The relatively low purchase cost of these "mobilehomes" is, of course, a direct reflection upon the urban land policy, not only of the US but of all other countries where there are few if any controls over the purchase price of urban land.

In another, though related, field we give a further instance of work done in connection with the utilization of space in dwellings: this time a system of analysis of useable space worked out by the Belgian group for the United Nations Economic Commission for Europe, Committee for Housing at Geneva.

Standardization in the planning field is to some extent handled by Julia Henderson (Director of the United Nations, Bureau of Social Affairs) in her interesting account of the similarity of the problems raised by the increasing development of world urbanization. In this article, without suggesting lines of solution, she brings an enormously varied issue down to a few simple and illuminating characteristics: The three types of urban environment that occur repeatedly and certain common social characteristics. She implies that efforts at handling the problem of urbanization might perhaps be usefully concentrated upon these fields. Her article was undoubtedly influenced by the Conference on urbanization in Asia and the Far East held at Bangkok in 1956 and reported in The Monthly Bulletin HIB-GA 14/15 November-December, 1956.

An interesting sidelight on Miss Henderson's theme is found in Theodore Geiger's article on the difficulties of inducing western standards of entrepreneurial mentality in tropical Africa. Similar articles might be written on many other parts of the world and perhaps cause a moment's pause to consider whether "planned urbanization" can in any way assist in solving some of these conflicts without necessary imposing all attributes of an alien culture.

Another interesting commentary on Miss Henderson's article is provided by a newspaper cutting from Hongkong describing standards of density which anywhere else (even in Manhattan) would appear totally fantastic.

Another theme which has often been expressed - more or less openly - in Ekistics is that the development of a sound housing program may often be best served not by building houses but by (a) providing an overall plan able to control where housing can be erected; and the price at which the land can be acquired for this purpose; (b) providing a pure water supply and (c) providing hard roads. Two articles in this issue point up the importance of these factors: the first on the regional development of Sardinia (centering on water supply) and the second a United Nations Seminar on low-cost roads for Asia and the Far East.

An article by an enterprizing young Englishman, Patrick Horsbrugh, gives a new title "Omnitecture" to what we here call "Ekistics" and some call "Regional Planning." His insistence in the importance of the broadly educated technical man as the only counteraction to unintelligent decisions by well-intentioned laymen is well founded.

Space this month has again been given to the design for "Brazilia", including much of the designer's own statements. Some critical comments upon this concept for a modern city based on "the drawing of two axes crossing each other, in the sign of the cross" will be included next month.

EKISTICS is compiled by Yvette and Lawrence Mann under the direction of Prof. J. Tyrwhitt. Enquiries or comments should be addressed to 77 Trowbridge Street, Cambridge, Massachusetts, USA

NOTE: The lettering at the top of each page refers to Doxiadis Associates system of classification. The figures below each title refer to the Universal Decimal Classification.

HOUSING

E.N.S.T.

Alcock, A.E.S.
BETTER EARTH BUILDING IN THE TROPICS
Corona: Colonial (now H.M. Overseas) Civil Service Magazine, 1956.
624.012.8 (66) (72)

1. This is a bringing up to date of an earlier article by Mr. Alcock in the same publication in 1949. The writer has been engaged in soil cement construction for low cost housing since 1946, and during his service in the Gold Coast (Ghana) he developed the subject considerably. From laboratory research over the past ten years, Mr. Alcock has arrived at a simple test based on scientific as well as field experience in Africa. Presently in Panama, the author says that the test quoted below applies to local soils in that country as well as to those in Africa. Laterites and latosols occur in both places.

2. In his introductory remarks he describes the use of 'sandcrete' (a mixture of clean sand, with cement) and 'swishcrete' (a mixture of soil known in Ghana as 'swish' with cement). To define the latter term more fully the following explanation is given:

> "'Swish' is a wide term, applied more often that not to laterite' also a wide term. The term 'laterite' from the Latin 'later,' a brick, was coined by Buchanan, who travelled in Southern India in 1807 and saw the red soil of that country used for brick manufacture. With the advance of scientific knowledge some attempt has been made to define 'laterite' more closely and we hear of 'laterite' and 'latosols.' The basic idea however is that 'laterite' and 'latosols' are soils that have weathered from the rocks in moist, warm climates, where luxurious vegetation, high temperatures and heavy rainfall produce soils eontaining plenty of iron and aluminium, which make good clays, and not much silica, which makes bad clays.

3. Alcock's test is described as follows:

"This is the shrinkage test. Make a box without a lid exactly two feet long inside by one inch and a half wide and one inch and a half deep inside. Oil or grease the inside surfaces of the box thoroughly. Put in wet soil without cement. The soil should have the same wetness as soil ready for ordinary earth building. The correct wetness can be tested by pushing a dry metal surface into a lump of the soil. A dry shiny knife blade or spoon will do. If the soil does not wet and smear the metal then the soil is too dry and more water must be added until it is sticky enough to leave a smear on a shiny metal surface pushed into it. Ram the soil into all corners of the box with a small stick, and finally use the stick to smooth off the surface. Place the box in the sun for at least three days or in the shade for at least seven days. Do not let rain fall on it.

"At the end of this time measure by how much the soil has become shorter in length by shrinking. You may have to add up the loss in length by shrinkage at each end of the box--or you may be able to push the soil, which should be dry and hard, to one end and measure all the shrinkage at the other end of the box.

"If the soil has shrunk not more than one half of an inch use one part of cement to eighteen parts of soil. If it has shrunk more than one half of an inch, but less than one inch use one part of cement to sixteen parts of soil. If it has lost more than one inch but less than one inch and a half, use one part of cement to fourteen parts of soil, while if it has lost more than one inch and a half, but less than two inches, use one part of cement to twelve parts of soil.

Alcock, A.E.S. Better Earth Building in the Tropics -- 2

"If the soil has cracked very badly at several places, not just one or two cracks, or if it has arched up out of the box - or has shrunk more than two inches, do not use it for building."

4. The testing of the strength of soil-cement blocks, when built together, was done as follows at Asawasi, Kumasi. Piers six feet high and eighteen inches square were constructed, and then loaded until they broke. "Hand made blocks eighteen inches long by nine inches deep and six inches thick crushed at forty-three pounds per square inch, or two and three quarter tons per square foot. Machine blocks twelve inches long, nine inches deep, and five inches thick crushed at one hundred and twenty-one pounds per square inch or eight tons per square foot. The blocks were laid on edge, i.e., in the weakest direction. The mixture in each case was eighteen parts of laterite to one part of cement and the blocks were taken without selection from the stacks used for building the housing estate. These tests show that the hand-made blocks were strong enough for the walls of houses of one floor only, while the machine-made blocks were strong enough for the walls of houses carrying the weight of one storey above the ground floor."

5. Other than pointing of external joints, outside treatment of structures constructed with these materials and techniques is usually unnecessary. Cement paints (although often pleasing in colour) and tar or bitumen, will usually flake off after a certain time. If the soil is not as good as had been thought, however, a coat or two of laterite wash can be applied and renewed as required. The wash is mixed from one part of red laterite, or other suitable coloured soils, ground to powder and mixed with two parts of a liquid made by boiling banana or plantain stems in water. The wash can be put on the walls hot or cold, and if it is too pasty more boiling water should be added for workability. Two coats are usually enough but may be renewed every few years as needed. (Note: this might be tested in India as an alternative from cow dung and water in banana growing areas).

E.M.S.T.

Comfort Survey Committee, National Buildings Organization, India
REPORT ON LOW COST HOUSING
Ministry of Works, Housing & Supply, Government of India Press, 1957
728.3 (540)

1. The Comfort Survey Committee which prepared this report was appointed by the Indian Government to study the design and performance of the houses put up for the International Exhibition on Low Cost Housing, in New Delhi, 1954. Principles which govern the design of low cost houses in hot regions, as recommended by the Committee form Part A of the report. Lt. General H. Williams, the Director of the Central Building Research Institute was chairman of the Committee. Of the Technical Committee set up to coordinate the work, Sardar Sarup Singh, Director of the National Buildings Organization was Chairman. Part B is a report by B.C. Raychaudhuri, Scientific Officer, Central Building Research Institute who gave the results of one year's investigation of 40 houses. It is reported separately on pp. 114-115 of this issue of Ekistics.

2. Part A takes the form of a tentative manual for low cost housing, incorporating the general principles involved in the layout, design, selection of materials, specifications and construction of houses. Some attempt was made to bring together available information on these subjects. Mainly single and double storeyed houses in semi-urban areas--including detached, semi-detached and terrace constructions--are covered in the Report. Size of plots, orientation of buildings, architectural treatment, standards of accommodation and planning of space, foundations, the damp-proof course, termite-proofing, superstructures, ceiling heights, roofs, doors and windows, and plastering are each given separate discussion.

3. Among the more interesting of their recommendations is a short statement on the controversial question of ceiling heights in tropical housing. In effect it asserts:

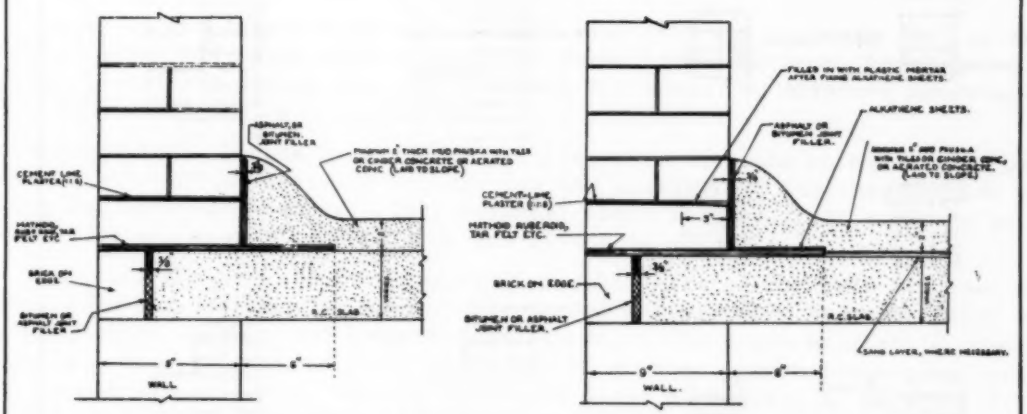
a. There shall be adequate head room in all rooms: Considered here must be artificial lighting fittings and ceiling fans. Neither of these should be fixed lower than 7' 6". Comfort indoors is independent of ceiling height if the temperature of the ceiling approximates to the temperature of the room.

b. The proportions of all rooms shall be such that they will not cause mental discomfort to the occupant: While psychological studies have not been conducted on the minimum level for ceiling heights, it is true that temporarily an unfavorable impression is registered by a person entering either a relatively small room with a high ceiling or in the case of big rooms with low ceilings.

c. Some authorities hold that a ceiling height of 9 feet is adequate for all buildings at the ground floor of two-storeyed construction in all hot climates. This height is also adequate for top floors in hot humid regions. Tests are being undertaken for top floors with various heights in hot dry areas. "It may be stated that from a purely scientific assessment of research so far carried out a ceiling height in excess of 9 feet does not by itself materially contribute to thermal comfort."

4. More liberal ventilation between roof and ceiling was strongly recommended, the ventilators being covered with close gauge wire netting or closely-placed louvers of asbestos sheet or timber. To prevent entry of birds and other animals. Insulation of the ceiling could also be aided by the use of mineral wool, strawboard or wood wool boards or by covering the upper surface of the ceiling with reflectors such as paper faced with aluminun or bright metallic paint.

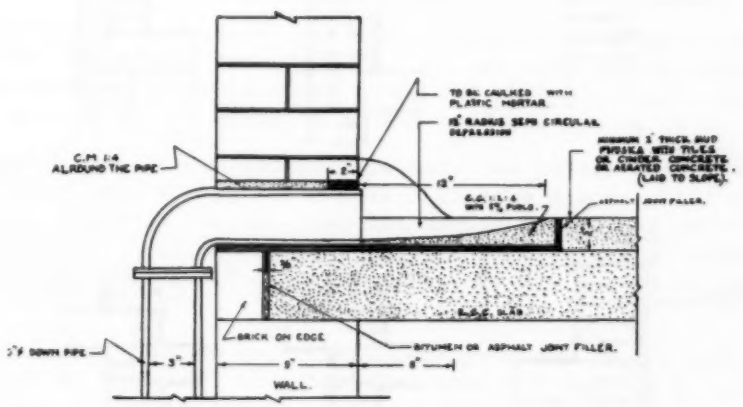
5. The final section of Part A is devoted to some general observations on novel techniques adopted in the construction of low-cost houses in the 1954 Exhibition. From these the following comments have been extracted.



DETAIL OF JUNCTION OF WALL & ROOF FOR FLAT TERRACES.

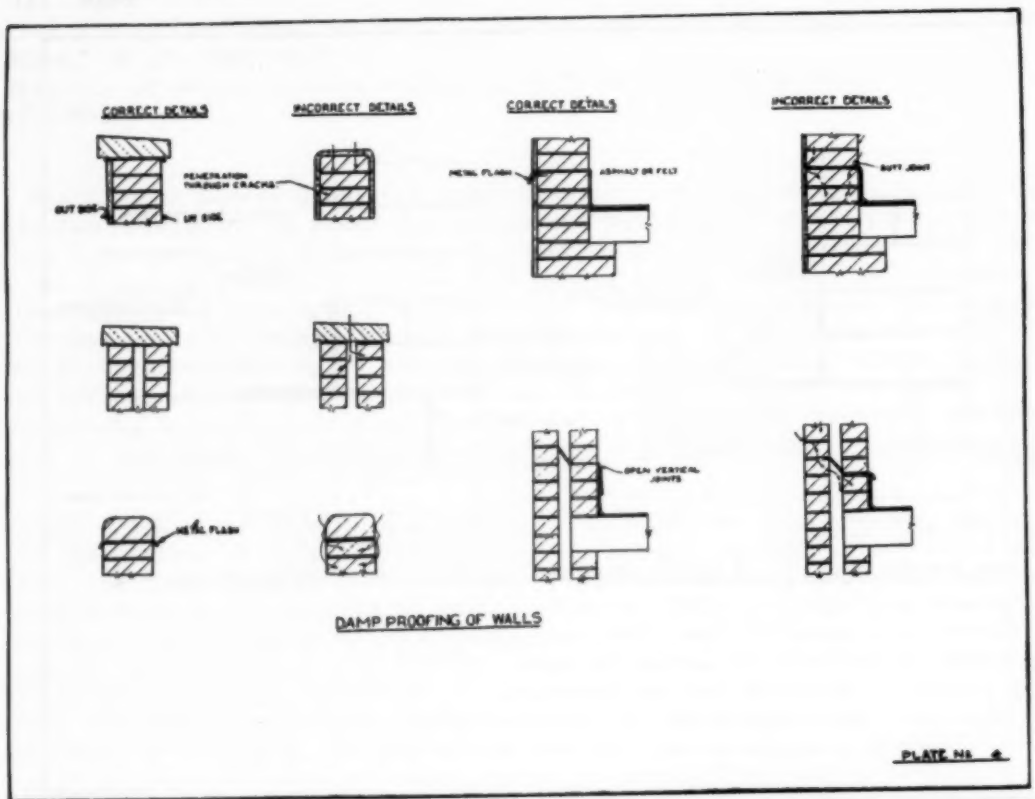
MEMBRANE WATER PROOFING WITH ALKATHENE

PLATE No 2



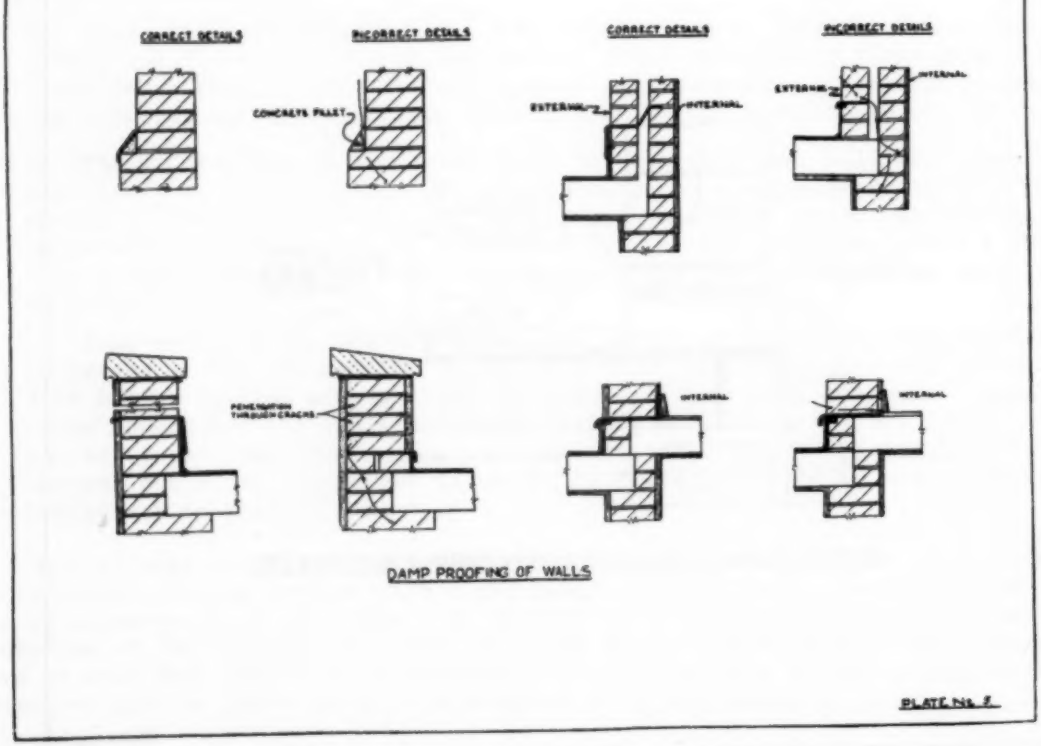
DETAIL OF JUNCTION OF WALL & ROOF SHOWING POSITION OF RAIN WATER PIPE

PLATE No 3



DAMP PROOFING OF WALLS

PLATE No. 6



DAMP PROOFING OF WALLS

PLATE No. 7

6. Reinforced cement concrete roofing provided without any water-proofing arrangement, depending only on the slope of the roof for preventing rain penetration has not met with much success in these buildings. Some of them have leaked, possibly because the concrete was not dense enough. Invariably the junction of the wall and the roof have separated due to expansion, which becomes considerable in the case of concrete slabs having no insulation on top.

7. Cavity walls, constructed with clinker or cinder aggregate in two leaves of $2\frac{1}{2}$ inches thickness, each with a cavity of three inches between, have proved structurally strong enough for single-storey building. No moisture penetration inside such walls has been noticed.

8. Hollow cinder blocks have proved satisfactory, from the point of view of structural stability, moisture penetration and durability; and they provide a good backing for internal plaster. This material seems to have great scope in areas where bricks are scarce or expensive and cinder is abundant.

9. The house constructed with "Aerocem" blocks (aerated concrete composed of cement, sand and 3/8-inch aggregate) has proved satisfactory from the point of view of thermal comfort and moisture penetration. There are no visible cracks in the walls. However, the ceiling consisting of aerated cement plaster on hessian cloth cannot be said to be satisfactory: It shows a tendency to separate from the wall, and special beadings will be necessary at this junction if the ceiling is not to look unsightly. Also electric wiring fixed to the ceiling has tended to break loose. But both defects can be removed by design improvements.

10. The system of fixing door and window shutters to the concrete frames through embedded wood blocks is unsatisfactory as there are indications that these get loose. There are also separation cracks between the concrete chowkat and the masonry, which can be controlled by grouting with plastic cement.

11. The vacuum concrete system has proved structurally satisfactory, and the house constructed of this material is found to be reasonably water-tight; but due to the thinness of the slab and lack of insulation, the roof slab has tended to separate from walls at the junctions. Treatment of such cracks with mastic may perhaps remedy the situation, but this condition is likely to recur with every change of season. Such separation is the natural outcome of the concrete getting hot due to its thinness and consequent expansion.

12. The system of roof construction with precast concrete joists and foamed concrete fillers has proved satisfactory. It has also proved water-tight with traditional methods of water-proofing using mud phuska. Hardly any separation cracks have been noticed at the junction of the roof and the walls in this construction.

13. The bamboo reinforced concrete columns and panels used in the construction of a certain house have so far stood well. In some places where slight cracking has been seen, it has been noticed that the bamboo inside has dried up and lost its tensile properties. It is doubtful whether this system of construction can be considered permanent, and further observations are needed to ascertain its probable life.

14. The jack arch roof on concrete joists provided in one house has shown cracks. The corrosion of the steel ties has also been noticed. Even slight settlement of walls can lead to cracks in the arch and this has been noticed in some parts of this roof.

15. Gypsum blocks have proved satisfactory for internal walls, but when used externally these blocks have shown cracks and erodibility. For external use they may require the same non-erodable plaster as is necessary for mud masonry.

15. The cavity wall construction with 1 1/2-inch precast concrete slabs, which was adopted by the West Bengal Government, has proved efficient from the point of view of moisture penetration. But inhabitants say that the house becomes very hot in the summer.

E.M.N.S.

Raychaudhuri, B.C.
COMFORT SURVEY PROJECT
Council of Scientific and Industrial Research, Govt. of India Press, 1957
(Bound with Comfort Survey Committee, Report on Low-Cost Housing.)
728.3 (540)

1. This is a report of scientific findings resulting from investigation on the thermal behaviour, ventilation, illumination and dampness penetration, which were carried out on forty full scale houses at the Housing Exhibition Site in New Delhi. Data for the period of observation (April, 1955 to March 1956) are recorded. A thermal behavior chart for different types of structures is presented. The first section is made up of discussions of the use of certain colour washes on external surfaces of the buildings, the necessity of specifying the location of windows, in addition to the window area for ventilation requirements, and the causes of dampness penetration. The second section takes up the effects of ceiling height on indoor comfort.

2. While most of the discussion takes the form of data presentation and elaboration, the following tentative recommendations are of general utility for hot and dry regions. Since the experiments were limited in duration, they are indeed tentative and "should be accepted as a guide only."

3. Design features.

a. In orienting a building two factors are for consideration, insolation and ventilation; and at times these give conflicting indications. For climates as in Delhi the mean wind direction in the afternoon during the monsoon should guide the orientation, a thermally sound roof taking care of the insolation.

b. The heating effect of the sun on a building with faulty orientation can be remedied by attention to the roof and by an intelligent use of chajjas and shady trees.

c. Closeable ventilators should be provided at ceiling level; permanent ventilators should as far as possible be avoided.

d. Heat capacity plays an important role in deciding the thermal performance of a building.

e. Where no artificial cooling aids are used, thermal diffusity plays an important part; thermal conductivity alone is not so important.

f. As far as thermal comfort is concerned, the roof is the most important component of a building and it should on this account receive special attention.

g. The ceiling temperature can be brought down considerably by white-washing the exposed surface of the roof.

4. Materials.

a. A roof of built-up thickness of 6 1/2 inches or more consisting of R.C.C. or reinforced brickwork, with or without mud-phuska, lime, concrete, etc., gave satisfactory results. (Due to moisture penetration, roofs of reinforced brickwork have deteriorated after a time, and their use is not generally recommended. R.C.C. roofs up to a thickness of 4 1/2 inches and stone roofs

should not be used without some insulation. A.C. sheets, G.I. sheets or Mangalore tile roofing should not be used without a false ceiling.

b. Nine-inch brick walls in cement, lime or mud mortar with 1/2-inch plaster on both sides affords adequate thermal protection. Eight-inch hollow blocks of concrete of gypsum are not thermally adequate.

5. Surface finishes

a. White, cream, biscuit and similar light coloured washes are thermally desirable for exterior surfaces.

b. Cement wash, red and similar deep colour washes should be avoided.

6. Dampness penetration

a. Where mud is used as an insulating material, a waterproof rendering should be used on the roof.

b. When using precast roofs, special care is necessary to avoid dampness penetration at the joints.

c. Corrugated A.C. and G.I. sheets, if properly laid may be relied upon as roofing materials.

d. Cavity walls and hollow block walls can be safely depended upon.

e. Four-and-one-half inch thick brick walls, even of first-class bricks and with rendering on both sides, have leaked and cannot be trusted.

f. Nine-inch brick walls with plaster on both sides have given satisfactory results in the Delhi climate, but may not be adequate in very exposed locations.

7. Ventilation

a. It is not sufficient to prescribe only the window area as a percentage of floor area. The distribution is also important and should be indicated.

b. When deciding the location of windows, the mean monsoon wind direction during the afternoons should be the guiding factor. The effect of faulty orientation may be remedied to some extent by suitably locating the windows.

c. From the point of view of ventilation, the width of a window is more important than its height.

8. Daylight illumination

a. The openings required for adequate ventilation generally produce adequate illumination conditions indoors.

b. From the illumination point of view the height of the window is more important than its width.

9. Ceiling height: Little difference was noticed in the indoor temperature of four identical rooms of 12' x 10' and with ceiling heights varying between 8' to 11' and in four other identical rooms of 11'6" x 9'6" and with ceiling heights carying between 7'6" to 12'.

E.S.T.

Uganda Protectorate
REPORT, DIRECTOR OF AFRICAN HOUSING
Draft, for inclusion in Annual Report, 1957.
728.3 (67)

1. This draft report was prepared by the Technical Division of African Housing. Several items of interest are extracted below.

2. Design policy. "New designs have been prepared during the year for all types and sizes of houses required by the Department. These have been designed on the grid system of planning which, from the point of view of dimensional co-ordination, places the main emphasis on a common modular dimension in two directions and a limitation in the number of components for standardization and prefabrication, with a view to facilitating continuous production by manufacturers independently of individual orders. The dimension of 3' 4" has been adopted as a basis for co-ordinating plan measurements in two directions. 'A.62' published by the Modular Service Association of America bases all planning components on a 4" grid while larger planning grids are introduced which vary to any convenient multiple of 4". The formula developed on these lines is $kM \pm d$, where k is any whole number, M is the module and d is a small fixed difference numerically less than M. Whilst this formula is applied in the U.S.A. to all types of building using conventional materials and construction, it has been found that a simplified formula based on a planning grid of 3'4" (G) with a module of 4" (M) is more applicable to the standardized systems of construction likely to be used by the African Housing Department. Thus all wall components can have a plan dimension of G or $G \pm M$, 4" being the thickness of internal wall partitions except in houses built of compressed Murram blocks where the thickness is 6" and M can be 3" or 2" plus 4". Normally, it has been found that the measurement G+M is not essential and can be regarded as special. This reduces the formula to G and G-M. With a grid dimension of 3'4" any of the following modules is mathematically possible:

1",2",4",5",8",10" or 20"

The normal span used in African houses is 3 x G or 10'0" which is the half roof dimension of single pitch. The bay units are normally 3 x G, 4 x G, or 5 x G which are the basic pre-cast purlin units, thus the maximum unit length is 16'8". Window openings have been reduced to G, 2 x G and 3 x G and all structural openings for doors are G - M. .....Vertical measurements for African Housing are related to standard 9" Concrete Block courses. Murram blocks where used being $4\frac{1}{2}$", courses can be interchanged without effecting the standard vertical dimensions, thus all special pre-cast units can be used in Murram or Concrete block houses without requiring any modification."

3. Standardization of Components. "Following the adoption of the technique of Grid Planning, all components for the new type houses have been reduced to the minimum number of different elements and have been standardized. All units are interchangeable within the grid, and are either G or G - M. Thus the components have been reduced to a single standard window element with pivoted louvres in one, two or three widths, each a multiple of 3'4"; a single ventilation unit; standard dimensioned doors; sink and draining board unit; shelving and chimney units."

4. Research. "Research has continued as far as possible within the limitations of staff and facilities available. New asbestos-cement products have been designed and prototypes have been tried and tested and where successful these units have been incorporated in the new house designs. So far, these include asbestos-cement pivoted window louvres, ventilator units, sinks and drain-

Uganda Protectorate. Report, Director of African Housing.

ing board units, and larder shelving. Further tests are being made on asbestos cement grease traps. Experiments have also been made on the painting of these units with various types of paint and it would appear that chlorinated-rubber paints are the most suitable and can be applied without any priming treatment.

Research into roof design has resulted in the standardization of a 10 degree pitch asbestos-cement roof utilizing a 5' cranked ridge sheet. Experiments are being made with various types of asbestos-cement, sheeting roofing, with 3" and 6" gauge corrugations and with the Canada Tile pattern sheets. The new type of re-inforced concrete purlin units have obviated the necessity for rafters and have proved more economical than the previous types of roofing supports.

5. Seven prototype houses have been constructed at Ntinda Estate, Kampala. utilizing compressed murram (earth) blocks stabilized with added cement in varying proportions. These houses have been treated externally with transparent silicones water-proofing solution which penetrates the surface to a depth of approximately 3/8".

6. Experiments and tests have continued during the year on various types of cooking appliances suitable for wood or charcoal and research continues on these and other types of appliances such as primus stoves. Research has also been started on sanitary appliances and it is hoped that a low cost pre-cast concrete latrine suitable for water-borne sanitation will be produced in the near future."

E.S.T.

Nelson. George and Chadwick, Gordon
EXPERIMENTAL HOUSE
Architectural Record, 122: 6, December, 1957. pp. 137-142. Illustrations.
728.3 ; 69.001.5 (73)

1. This is the presentation of an experimental house by Nelson and Chadwick as part of an extensive showing of George Nelson's contributions to several kinds of design. We extract the description of the experimental house, together with comments by some of those impressed by this particular design.

2. "Mobile forms of shelter such as trains, buses, trailers and planes exhibit the forms and structures typical of a high level technology, but the house has lagged behind. The George Nelson office has developed an experimental house designed as if it were an industrial product, a structure produced by a highly advanced large-scale manufacturer. In developing a solution no attention was paid to cost or market acceptance. The house is an experiment, not a saleable product.

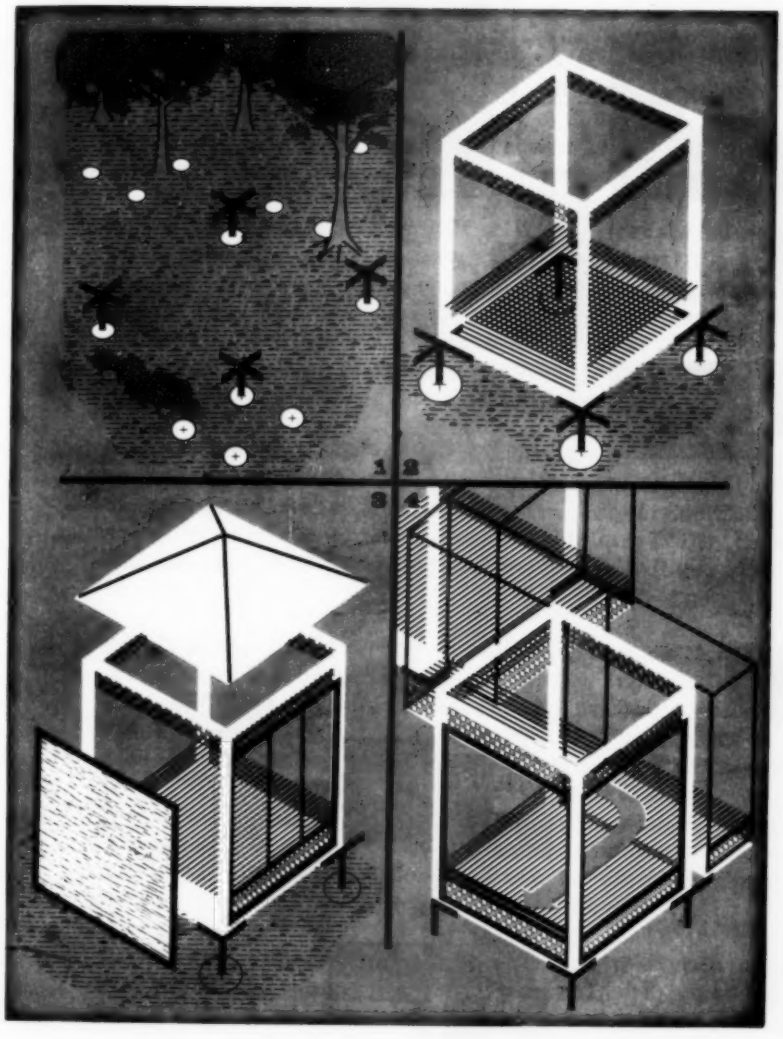
a. FOUNDATIONS: To reduce site labor to a minimum and eliminate the use of costly earth moving equipment, this proposal involves the use of a boring machine for adjustable metal foundations.

b. STRUCTURE: The structure is a conservative metal cage. The unit is a square, 12 by 12 ft in plan, a size which provides enough space for most furniture groupings. It can obviously be multiplied. A light truss forms the top member of the frame. Floors are used to brace the structure.

c. WALLS, ROOFS: Walls could be made of light weight material in large sizes. Roofs were considered as a symbol of the needs of people, emotional as well as physical. It is quite clear that top lighting is superior to windows or glass walls in many cases and that the possibilities of visual effects which can be obtained by its use have not been fully explored. The dome as indicated in the model is an unbroken surface of translucent plastic. In actuality it would be a complex structure of both metal and plastic, containing thermal insulation, sound absorbing materials, possibly a part of the ventilating system, and devices for light and solar heat control.

d. CORRIDORS, PACKAGES: In order to provide flexibility for planning it became necessary to add a second major item of inventory. This is a cantilevered structure 4 by 12 ft in plan which hangs from the frame. It serves as a corridor but is equally usable as a room extender, bed-storage alcove and a housing for service packages. Mechanical and other services are visibly moving in the direction of package installations. Work has already been done by the Nelson office on storage and kitchen packages. Pullman bedrooms and bathrooms suggest other possible extensions of the same idea. Heating-Cooling packages would service the units individually or in groups. All services would come as assemblies to be plugged into the standard frameworks."

3. "Once the basic units had been worked out, the problem of their arrangement presented itself to the designers. A rectangular configuration created a noise problem, because the components of this house were expected to weigh less than today's builder house of prefab and would therefore transmit more sound. To avoid this it was decided to break up the house into a series of semi-isolated living areas using the space between the units as the primary method of controlling sound transmission. The result of this decision was a plan showing the house as a series of pavilions. One of the virtues of the system is that the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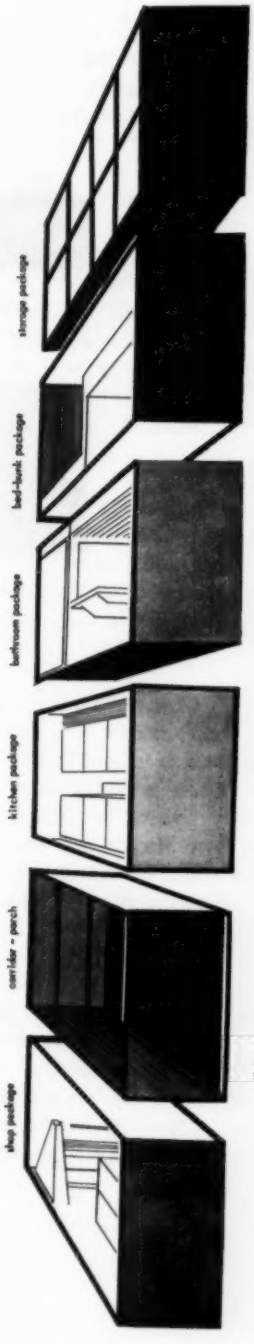
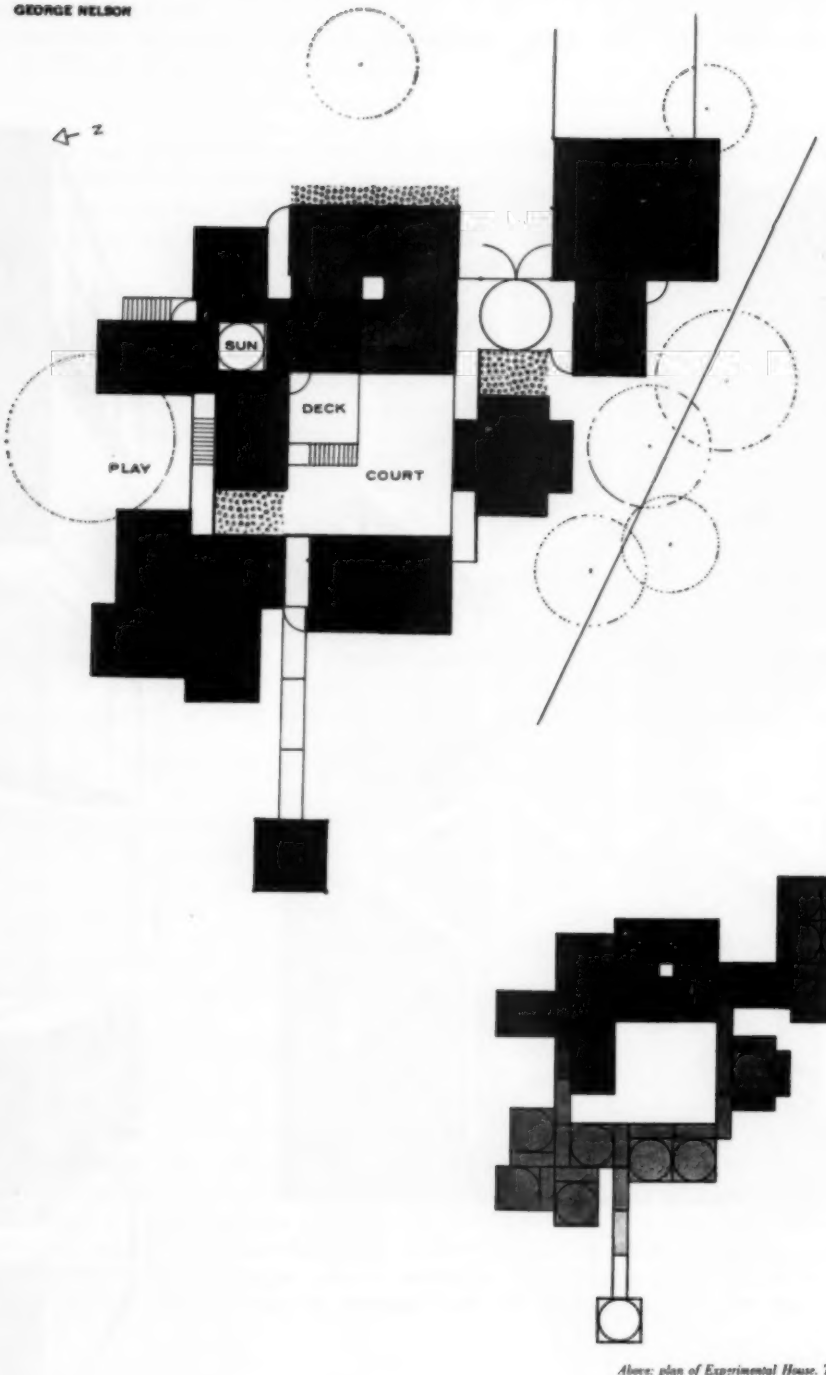

storage package
bed-chamb package
bathroom package
kitchen package
corridor - porch
shop package

GEORGE NELSON



Above: plan of Experimental House. Tones from light to dark indicate the relative levels of each group of pavilions in relation to a downward slope. The dark rectangle is the highest point, the white square the lowest. The house adapts to different levels of terrain with ease. Opposite page: basic components of house

Nelson, George and Chadwick, Gordon. Experimental house.

plan could expand and contract according to the needs and financial status of the family with very little disturbance to the portion of the house to remain."

4. "The standardization of all parts and the ease with which they could be specified would result in a great cost saving which could be applied to furniture and landscape. The large number of combinations of materials and shapes and the many adjustments to contour and terrain possible afford the architect an opportunity to create interest and variety within a unified whole."

5. The four following quotations are given to indicate the reception this experimental house has received:

a. PIETRO BELLUSCHI: "Of all the prefabricated and experimental houses I have seen in recent years, this gives me the greatest thrill. Unfortunately, the test as ever will be on economic grounds, that is, on the ability to produce these units with all the services at a lower cost than a conventional house. There is no question though that from a creative and intellectual point of view, it is a most exciting concept. I hope some industry will finance its development."

b. ARTHUR DREXLER: "George Nelson has treated his Experimental House as an aspect of product design rather than architecture. By taking advantage of American methods of production, distribution and obsolescence, he is able to offer a product technically superior to its handicrafted competitors. The design also provides an unexpected luxury by way of its elegant pavilion-like plan."

c. CHARLES EAMES: "My first exposure to George's house was extremely short, but interestingly enough, my impressions were unusually clear and strong. First--The concept is so simple than it can be grasped in a matter of seconds. Second--It is a module, but it is a true volume module at a scale which seems surprisingly natural. Third--One is immediately drawn into thinking of the space as an experience. An experience in which one wants to take part. It is hard to say what the connections are--remembered Alhambras, or playing house under grandmother's cutting table. Whatever it is, I suspect that has little to do with conscious style and has a lot to do with human scale--and human need."

d. MINORY YAMASAKI: "George Nelson's aluminium house is the most exciting new thinking I have seen in the field of house design. It shows for the first time positively the advantages possible to residential building through the full use of technology and prefabrication. I think it wonderful because it points a way out of our present dilemma in housing. The delight it promises through the interest and surprise inherent in its plan mean much to our residential future."

D.E.P.

Stinson, Robert J.
MOBILEHOMES--Low Cost Family Shelter
Engineering News-Record, 160:3, January 16, 1958. pp. 40-48. Illustrations.
728.76 (73)

1. This is a report by Mr. Stinson, Assistant Editor of Engineering News-Record, on "mobilehomes", which are seen as significant competitors to the housebuilding industry (including prefabricated home manufacturers). In the USA the mobilehome producers have carved out a large chunk of the business of providing shelter, partly because they can more easily be financed. Preoccupied with difficulties in their own field, as well as an almost insatiable market, the homebuilding industry has not appeared to notice the growth of a different but parallel industry.

2. The manufacturers of the houses on wheels have progressed greatly since the time when their product was "just something to hook on the back of a car and be bounced over country roads during a two-week camping trip." The problem of this industry has in fact been to overcome a derogatory name ("prefab" or "trailer" and "trailer Camp") and the unfavorable mental picture connoted.

3. To deal with these problems, the industry had to develop a radically different product in terms of quality and comfort, but one which still could be hitched to the back of a car and rolled on its own wheels. It also came up with a new work which sucinctly described the product but eliminated earlier unfavorable reference.

> "The new work is 'Mobilehome." Through vigorous merchandising and the habit of individuals in the mobilehome industry to correct a person who refers to their product as a 'trailer', the new word now is fighting for a position in the latest dictionaries."

4. The mobilehome gained popularity with a large segment of the American population. It has also captured a larger share of the new house market than the manufacturers of prefabricated houses.

5. This is pointed up by considering year-by-year growth of the industry. In 1954 6.4% of the 1.2 million private housing starts were prefabricated and 6.3% were mobilehomes. In the following year, with its near-record of 1.3 million private housing starts, prefabricated housing units claimed 7.1% of the total: but the mobilehomers produced 111,784 units or 8.5% of the total. With the slump of 1956, total housing starts were slightly over one million, and the prefabricators held their own with 8.7% of the total. But in mobilehomes 1956 was a year of a 25% increase in production of 139,690 units, which made up 12.8% of all private housing starts. In 1957 the slump in housing starts continued, and an estimated 975,000 housing starts is the total for the year. In this climate, prefabricators saw their product decline by 10.4% during the first six months, and their share of the private market remain under 8%. The Mobilehome manufacturers, on the other hand, continued to boost production in the face of the second straight year of general decline in the housing field. During the first eight months they produced 94,960 units, which showed a 2.8% gain over the same period in 1956; and they increased their relative share of the housing starts to 13.5%. Thus in a period of four years, mobilehomes have more than doubled their relative share of American housing production, and they presently comprise something more than one-eight of the total residential building.

Stinson, Robert J. Mobilehomes--low cost family shelter.

5. It is often said that the people served by mobilehomes are just "people on the move" and that it is unnecessary to be concerned with these people. But it seems that the name "mobilehomes" and the lack of good statistics on the subject may be leading other builders astray. For one expert on the subject has said that 75%-80% of the mobilehomes never move more than 50 miles from the place of purchase. The degree of mobility seems to be that "it is bought and then moved to a site where it is placed on blocks or a foundation, rarely to move again. An 11-man group of MIT and Harvard University faculty, working on an ACTION project with a grant from the Ford Foundation, have more generally recognized the same point. After pointing out that mobilehomes have outsold the "prefabs" year after year, they add that "the average trailer never moves 100 miles from where it was bought." This group has criticised the house-building industry for being "almost the last major sronghold of preindustrial craft production," and they feel that homebuilders ought to give more attention to the methods used in producing an "often over-looked competitor--the trailer."

6. Very recently it has become apparent that estimates for a big housebuilding boom in the mid-1960's stemming from new family formations are in error. The reason is that there is a considerable lag between time of marriage and time of house purchase. While the average age of marriage has been 22.9 years for men, the average age of the homebuyer under federally aided (non veteran) financing has been 34.6 years, leaving a gap of 11.7 years. One reaction has been increased advertising for engaged or recently married couples to save for a down payment on a new house. Also, builders are being encouraged to build homes of very low cost and with as few as four rooms--so as to be suitable for the newly maried and also the retired couples.

7. The total cost of a mobilehome is quite attractive. Price range from $3,000 to $9,000, with the heaviest sales in the $4,500 to 5,000 area. Down-payments, however, are high--as compared to a conventional house. Cash requirements range from one-fourth to one-third of the total, with the balance financed over periods running from three to seven years. The high down-payment is offset by the fact that the buyer can put most of his cash resources into a mobilehouse without having the problem of buying and paying for furnishings and major appliances--both come with the unit and are included in the total price. In addition, low monthly space rental attracts the lower income groups. In a mobilehome park, site rents range from $20 to $50 per month (although there are now some exclusive parks charging up to $200 per month); and these facilities can provide the utmost in comfort. They can no longer be thought of as a "shoddy substitute for conventional housing."

8. A recent trend is the selling of sites, together with facilities, for mobilehome owners. Another innovation has been the combination of mobilehomes with the construction of permanent additions around the unit--including living room with fireplace, patio, porches, utility room, carport or recreational area.

9. It is pointed out that the greatest inroads made by mobilehomes came during a period when homebuilders had become almost contemptuous of minimum-price-range shelter, and low-cost housing generally. It appears now that many builders are ready to turn their attention to low-cost housing once more. But, although low price is the obvious answer to meeting the competition, the more complex and true solution for the USA and other highly industrialized countries involves increased productivity, and the development of methods by which low-cost productivity can be achieved.

D.E.I.P.Q.

Hongkong Times
HONGKONG HOUSING PROBLEM: Discussion and Suggestions
February, 1958 (Unidentified Clipping sent by a correspondent).
333.322 (51)

1. This is a journalist's report of a recent meeting of the Engineering Society of Hongkong, during which suggestions to improve or solve the housing problen in Hongkong were put forward. Present to describe and discuss the activities of the Government and the Housing Authority were Mr. G.T. Rowe, Commissioner of Housing and Mr. W.E. Collard, Secretary to the Housing Authority.

2. Giving a brief description of the background of the housing situation in Hongkong, Mr. Rowe said that 20 years ago the population of the Colony was about one million, of which about 80% lived in the urban area (Honkong Island, Kowloon and New Kowloon). There were about 80,000 domestic premises to house them. At that time the population was increasing steadily at the rate of 20,000 to 25,000 per year and domestic premises increased in proportion. At the outbreak of the Second World War, the population was about 1,600,000 and the number of domestic premises in the urban area about 84,000. During the war a great deal of damage was caused to domestic property. A survey carried out under the British Military Administration estimated that 20% of the available domestic accommodation was damaged or destroyed, and half of this was totally destroyed. At the end of 1946 the Colony was estimated to have regained its prewar population of 1,600,000. It had not, of course, regained its domestic accommodation, although repairs to the damaged property were effected fairly swiftly. It was some time before the houses which had been destroyed were replaced. Records indicate that this "catching up" came about no earlier than 1950; but by that year Hongkong was receiving again large numbers of refugees from China--and that movement appears to have continued ever since.

3. Commenting on the present housing situation, Mr. Rowe said that at the end of December, 1957, the population of the Colony was estimated at 2,677,000. 83% or some 2,214,000 persons are living in 36 square miles of the urban area. Of this number 229,000 persons are housed in resettlement accommodation; and 325,000 are estimated to be without regular housing of any kind. More than 1,660,000 persons were occupying regular housing. The total number of domestic premises in the urban area is about 110,000--averaging one domestic accommodation for every 15 persons. Of these domestic premises, a breakdown shows that 1,244 are houses; 8,947 are large flats; 12,284 are small flats; 82,245 are tenement floors; and 5,713 are low-cost housing units.

4. To point up the existing overcrowding, Mr. Rowe described the average area of a tenement floor as 350 square feet. If every person living on that floor was to have a minimum habitable space of 35 square feet (the minimum laid down by the Public Health and Sanitation Ordance) than the average capacity of a tenement floor without overcrowding would be 10 persons. This would mean that the total of 82, 245 tenement floors may not accommodate more than a little over 800,000. While it is difficult to work out precisely the possible area of houses and flats because of their great variation, it was thought probable that domestic accommodation in the urban area should not be housing more than one million persons. The others "should not be there," it was felt. This indicates that the Colony needs as a minimum, one square mile of additional housing before statutory overcrowding could really be prevented.

Hongkong Times. Hongkong housing problem - 2

5. But the problem would not really end with such provision either. For the population of Hongkong has "just kept on increasing" Natural increase in 1957 was 75,000 and total increase was more than 100,000. To accommodate 100,000 additional persons 10,000 tenement floors would be required at a cost of about $100,000,000 for construction alone. At a density of 1,000 persons per acre, 100 additional acres would be required every year.

6. The question of "How far are we moving towards some solution?" was raised by Mr. Rowe. It was pointed out that the average rate of building by private enterprise in the past five years was about 1,000 new buildings per year. Much of this, however, was accomplished by the demolition of old property; so the actual increase in the number of buildings was about 700 buildings per year. The total capacity of such accommodation could house no more than 40,000 persons additionally each year. Government assistance towards improving the housing situation dates back to the period at the end of World War II. At that time the Housing Society became one of the first institutions to operate in this particular low cost housing field. Recently this group had expanded or committed more than $16,000,000, providing for schemes which when completed would house over 13,000 persons.

7. A significant step was taken about 1951 when resettlement areas started. These were built on by the resettlers themselves or by benevolent societies or contractors. The total expenditure of resettlement areas was about $9,000,000 and the total capacity of the resettlement area was about 75,000 people. The most important single step taken was after the disaster at Shek Kip Mei, toward the end of 1954. (In this catastrophe, fire destroyed the largest area of squatters' huts). The Government at this time decided to build, maintain and manage accommodation suitable for resettlement of squatters in large, multi-storeyed estates. (Ed. Note: This is mostly 6-storey blocks of 9 x 12 rooms, and at least five persons must occupy each room.) An up-to-date estimate of the total expenditure actually committed on resettlement estates was over $83,000,000; and the total capacity of schemes in the estates when actually completed would be 244,500 persons.

8. At about the time the Resettlement Department went into building the multi-storey estates, the Housing Authority was established. The Authority considered providing accommodation for people living in over-crowded and unsatisfactory conditions. They decided after consideration to cater particularly to the class in the income group of between $300 and $900. The total expenditure committed by the Housing Authority was over $91,100,000; and the total capacity of the schemes (Java Road, Cadagon Street, and So Uk estates) would be nearly 50,000. All of these figures are said to indicate a moving toward improvement in the situation. But the Commissioner held that:

> ...If one was undertaking a regular programme of building year-by-year sufficient to house the increasing population and yet make radical improvement in conditions as they existed, the expenditure would be so enormous that Government would not be able to finance it.

It was felt possible that such costs might be paid by Government and private enterprise, but private enterprise would have to provide the major portion of the capital. Provision of land is the greatest difficulty. Land for building is very scarce and getting much scarcer.

Hongkong Times. Hongkong housing problem -3

9. Mr. Collard, Secretary to the Housing Authority, told the meeting that, apart from the resettlement schemes, the most active organisation was the Hongkong Housing Authority, which was set up in 1954. Describing Java Road Estates at North Point, the Authority's first project, the speaker told how this 3.5 acre site fronting on the harbour became a fully constructed estate in May, 1956 after less than two years work. The initial cost of the scheme, including $4 million for land and $3.5 million for piling, was $35,840,000. Rents vary from $60 to $138 depending on the size of the flat.

10. The Housing Authority began work on the second scheme at Cadogan Street, West Point in July 1956. This site was again about 3.5 acres, was on a steep hillside ("the gradient in some cases were 45 degrees"), and was originally a squatter colony. The Cadogan Street Estate will have a total of 636 flats and will accommodate more than 4,000 people. Rents are expected to vary between $82 and $127 per month.

11. The third scheme, according to Mr. Collard, was the most ambitious so far; and when completed would be the largest domestic scheme undertaken in South East Adia. This project is the So Uk Estate at Cheung Sha Wan, with a site covering an area of 19 acres. Site formation, which started last February, should be completed in April next year. This Estate will have 5,200 flats in multi-storied blocks of 12 to 16 stories in height, and the total number of residents will be about 32,000. The over-all cost of the scheme is expected to be between $45 million and $50 million.

12. It was revealed that the Housing Authority is planning the development of a fourth scheme at Clear Water Bay Road. The area of this site, which is north of the Airport, is about 25 acres. In addition the Authority had been allocated other sites in Kowloon and on the Island, which they would examine toward the end of the year for their consistent and long-term building plan which is aimed at giving them at least a section (if not a whole estate) completed every year.

13. One suggestion was raised by Dr. S.Y. King, Vice-President of the Engineering Society, who felt that the development of the many nearby islands as alternative building sites for the increased population--together with the provision of ferries--might help. Mr. Rowe commented that this was "a nice solution," except that 80% of the population could not afford to live anywhere except in the urban area, near the centre of supply of services and goods. In practice this solution would not be as effective as moving a large section of the population and the movement of industry out of the urban areas--and the only movable kind of industry is light industry. While Dr. King's suggestion was considered a possible solution, it was not thought to give an immediate solution.

14. Standardisation and prefabrication were suggested, with the observation that they had brought down building costs in other parts of the world. If was felt, this type of operation would be more costly in terms of the economy and the industry of Hongkong. A lack of considerable construction equipment to handle large pre-fabricated units was observed. RCC was best for the Colony.

15. A final suggestion had to do with very large skyscrapers, such as had been built in South America for example. The suggestion was that future buildings be constructed to go up an additional 100 feet or so-thereby providing double accommodation for the same ground area. Mr. Rowe, however, said that the higher the building, the more expensive would be the accommodation.

E.N.

Defay, J. and Lebegge M.
L'UTILISATION DE L'ESPACE DE LOGEMENT
Habiter, (Institut National du Logement, Belgium) October-December, 1957
pp. 129-138. Illustrations and Charts.
333.322.2 (100)

1. This presentation outlines the method for the analysis of the utilization of space which the Belgium delegation has proposed to the Committee for Housing, Economic Commission for Europe, United Nations, at Geneva. Without prejudicing the developments and perfecting of methods, it is felt that it may be of some use to open this relatively little-explored field for the consideration of technicians and the general public.

2. The proposed method is based on the known activities taking place in the dwelling, the surface required for them, the means of accomplishing them, and the time at which they take place. The method includes three phases:

a. Evaluation of the dwelling surface among the different function
b. Description of the manner in which these functions take place and the different rooms in which they are practiced.
c. Comparison of several plans according to these functions by the methods of the coefficient below.

3. First Phase. (Evaluation of the dwelling surface among the different functions.) The functional analysis of a plan supposes a thorough knowledge of the functions, so as to define the services expected of the dwelling and to make an inventory of the function. Nine general functions distinguished are:

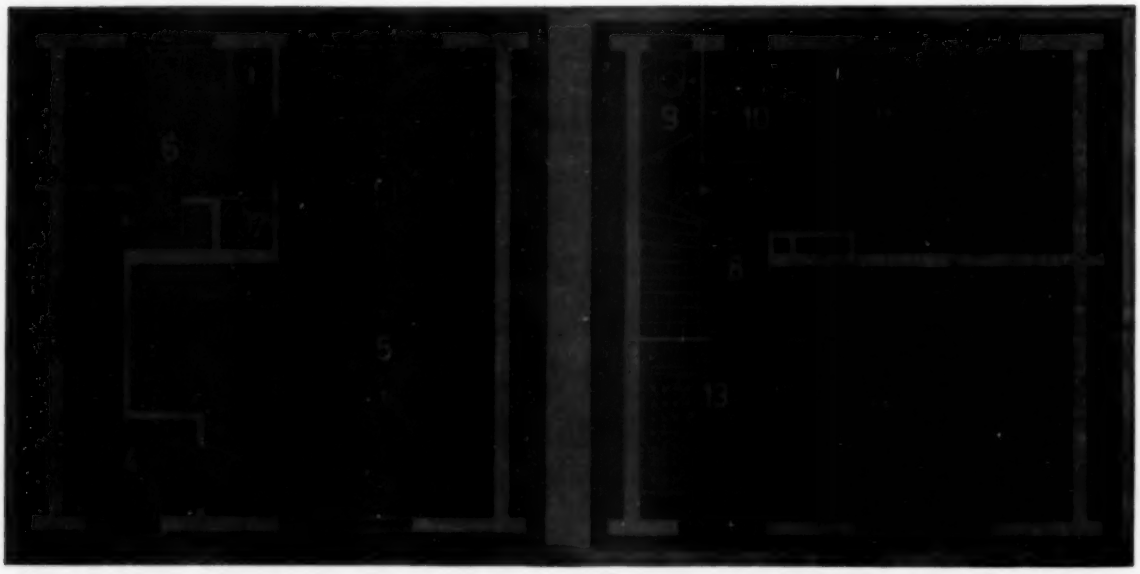
a. Relaxing, reading (se détendre, se cultiver)..(1)
b. Cooking . . . .(2)
c. Eating . . . .(3)
d. Sleeping . . . .(4)
e. Studying, playing . . . .(5)
f. Personal cleansing ("faire sa toilette"). . ..(6)
g. Eliminating body wastes (w.-c.) . . . .(7)
h. Washing clothes, laundry . . . . . .(8)
i. Circulating, wandering, various . . . . . .(9)

This nomenclature enables the analyst to give each room a cote analytique, composed of the number of the functions to which the room offers service. The analysis consists of evaluating in tabular form the surface of each room according to nine columns corresponding to the nine functions. To establish such a table, precise rules must be adopted concerning the way to separate the surface of a room in which several functions take place. It must also be considered that some rooms or parts of rooms serve several functions, but in successive rather than simultaneous order. Finally some "zones" of a room have only a single function. This phase of analysis enables us to see quickly two kinds of deficiencies:

1st. the functions for which nothing has been forseen
2nd. The interferences between two activities.

Tableau 1 — ANALYSE DE LA SURFACE DU PLAN A

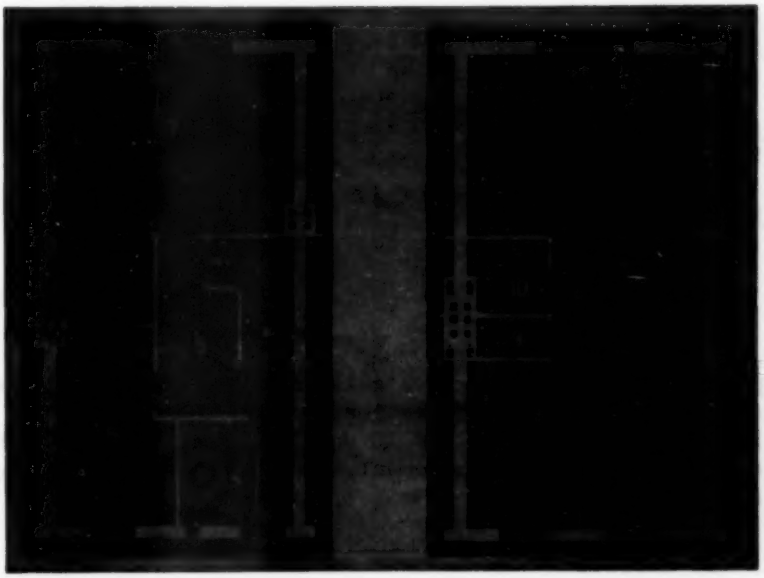
N° de la pièce	DÉSIGNATION	Cote analytique	Surface (m²)	IMPUTATION DES SURFACES AUX FONCTIONS (en m²) 1	2	3	4	5	6	7	8	9	Surface d'utilisation simultanée
5	séjour	1.3	23,77	15,33	—	8,44	—	—	—	—	—	—	—
6	cuisine	28	6,26	—	6,26	—	—	—	—	—	6,26	—	—
11	chambre des parents	4	8,47	—	—	—	8,47	—	—	—	—	—	—
12	chambre d'enfant	4.45	12,35	—	—	—	12,35	8,35	—	—	—	—	—
13	chambre d'enfant	4.45	5,71	—	—	—	5,71	3,71	—	—	—	—	—
Surface des locaux habitables			56,56										
4	dégagements du rez-de-chaussée	9	4,89	—	—	—	—	—	—	—	—	4,89	—
7	réduit du chauffage	9	0,49	—	—	—	—	—	—	—	—	0,49	—
8	dégagements du 1er ét.	9	5,05	—	—	—	—	—	—	—	—	5,05	—
9	W.-C.	7	1,16	—	—	—	—	—	—	1,16	—	—	—
10	salle de bain	6	2,32	—	—	—	—	—	2,32	—	—	—	—
Surface des autres locaux			13,91										
Cloisons et murs intérieurs			2,85										
Surface utile totale			73,32										
Surface dévolue à chaque fonction : — en m²				15,33	6,26	8,44	26,53	12,06	2,32	1,16	6,26	10,43	—
— en % de la surface utile				21 %	9 %	12 %	36 %	16 %	3 %	2 %	9 %	14 %	—
Total des surfaces imputées en % de la surface utile : 122				Total des surfaces d'utilisat. simult. en m²									néant
				Total des surfaces d'utilisat. simult. en % de la surface utile									néant



Plan A — 4. Hall — 5. Salle de séjour — 6. Cuisine — 7. Chauffage — 8. Dégagement — 9. W.-C. — 10. Bain. — 11. Chambre des parents — 12. Chambre d'enfant — 13. Chambre d'enfant.

Tableau 2 — ANALYSE DE LA SURFACE DU PLAN B

N° de la pièce	DÉSIGNATION	Cote analytique	Surface (m²)	IMPUTATION DES SURFACES AUX FONCTIONS (en m²)									Surface d'utilisation simultanée
				1	2	3	4	5	6	7	8	9	
6	cuisine.	28.283	8,71	—	8,71	2.00	—	—	—	—	8,71	—	—
7	séjour	3.15	20,96	8,05	—	4.86	—	8,05	—	—	—	—	16,10
11	chambre des parents .	4	17,29	—	—	—	17,29	—	—	—	—	—	—
12	chambre d'enfant. . .	4	8,05	—	—	—	8,05	—	—	—	—	—	—
13	chambre d'enfant. . .	4	7,12	—	—	—	7,12	—	—	—	—	—	—
Surface des locaux habitables			62,13										
4	hall d'entrée	9	4,81	—	—	—	—	—	—	—	—	4,81	—
5	dégagements du rez-de-chaussée.	9	9,83	—	—	—	—	—	—	—	—	9,83	—
8	dégagements du 1er ét.	9	7,80	—	—	—	—	—	—	—	—	7,80	—
9	W.-C.	7	1,07	—	—	—	—	—	—	1,07	—	—	—
10	salle de bain	6	2,64	—	—	—	—	—	2,64	—	—	—	—
Surface des autres locaux.			26,15										
Cloisons et murs intérieurs			1,98										
Surface utile totale			90,26										
Surface dévolue à chaque fonction :													
— en m²				8,05	8,71	6,86	32,46	8,05	2,64	1,07	8,71	22,44	
— en % de la surface utile				9 %	10 %	8 %	36 %	9 %	3 %	1 %	10 %	25 %	
Total des surfaces imputées en % de la surface utile : 111				Total des surfaces d'utilisat. simult. en m².									16,10
				Total des surfaces d'utilisat. simult. en % de la surface utile									18 %



Plan B
4. Hall
5. Dégagement
6. Cuisine
7. Salle de séjour
8. Dégagement
9. W.-C.
10. Bain
11. Chambre des parents
12.-13. Chambres d'enfants

Defay, J. and Lebegge M. L'Utilisation de l'espace de Logement -2

4. Second Phase. (Description of the manner in which functions take place and the different rooms in which they are practiced). The simple evaluation of the surface according to the various functions is insufficient to estimate the degree of comfort with which the activities are carried out. The real occupied space is not always of primary relevance; rather, it is above all the way in which this space is occupied which is important. The second phase consists of a comparative description of the way in which each function is performed in each of the plans discussion:

a. Number of rooms where the function takes place.
b. Analysis of these rooms, completed by a description
c. Surface of these rooms
d. Relations between the rooms (circulation, communication, furnishing).

5. Third Phase. (Comparison of several plans according to the functions by the method of the coefficient.)
Some characteristics of the plans can be revealed by some coefficients obtained by dividing one of the selected surfaces by the other in the table of analysis. While one could multiply to infinity the number of comparisons of this sort, it is felt that certain among these are capable of aiding the researcher in the appreciation of a plan.

Example:

		PLAN A	PLAN B
1.	$\frac{\text{Surf. habitable}}{\text{Surf. utile}} = \frac{SH}{SU} \times 100$	77,1	69,8
2.	$\frac{\text{Surf. diurne habit.}^{*}}{\text{Surf. utile}} = \frac{1+2+3+5}{SU} \times 100$ . . .	58	36
3.	$\frac{\text{Surf. nocturne habitable}}{\text{Surf. utile}} = \frac{4}{SU} \times 100$	36	36
4.	$\frac{\text{Surf. de service}}{\text{Surf. utile}} = \frac{6+7+8}{SU} \times 100$	14	14
5.	$\frac{\text{Surf. des dégagements}^{**}}{\text{Surf. utile}} = \frac{9}{SU} \times 100$	14	25
TOTAL 2 to 5.		122	111

6. The method presented is intended as a guide for the attention of a person engaged in research. It should be a direction for his reasoning. But it does not propose a solution or conclusion, and it does not give a formula which by automatic application would replace judgement, good sense and experience. It can be regarded as a working tool.

* Daytime habitable surface
** Surface of passages

PLANNING

D.H.K.O.U.

Dozier, Craig L.
ESTABLISHING A FRAMEWORK FOR DEVELOPMENT IN SARDINIA: The Campidano
The Geographical Review, Vol 47: 4, October, 1957. pp. 490-506. Maps.
711.2 (45)

1. This paper is based on investigations by Prof. Dozier into development potential and progress on the island of Sardinia. Field work was done during the summer of 1955, and was in cooperation with Prof. Silvio Vardabasso of the University of Cagliari, Dr. John A. Logan of the Rockefeller Foundation International Health Division mission to Sardinia, and Sig. Ing. Luigi Musio of the Ente Autonomo del Flumendosa.

2. The history of Sardinia has been that of a conquered land which has been constantly been exploited. The Phoenicians, Carthaginians, Romans, Moors, Pisans, Genoese, Spaniards--all have used this island as a place of extraction and of strategic value. For modern Italy Sardinia has been a storehouse of such minerals as coal, lead and zinc. At the same time the life of the island itself has remained mainly pastoral and self-sufficing. The environmental forces present in the island have kept it from being an attractive place and have effectively blocked development. It has only been through the very recent control of these forces, combined with an enlightened policy of the Italian Government toward the area, that effective development may now be possible.

3. The Conquest of Malaria. Over-working the soil to meet grain tributes in Roman times, along with cumulative over-grazing through history, caused a debris formation to obstruct the streams and convert fertile coastal plans into pestilential marsh-lands. Local relief and an impermeable soil provided pockets for stagnant water (used by malarial mosquitoes) even in the uplands. The island's population declined from about half a million in Roman times to only 160,000 by the middle ages. By 1924 some 89% of the surface of Sardinia was said to be malarial. This island accounted at that time for 25% of all Italy's malarial zones and nearly 40% of the cases of malaria declared. "Malaria, through the ages, not only had lowered the productive capacity of the inhabitants but also had reduced the effective cultivable area of the island. It is not wonder that little serious thought was given, either by Sardinians or by Italians, to a more effective utilization of the island's resources." The Anopheles labranchiae, or malarial mosquito, had adapted itself well to the condition of the island. Only a very large-scale effort could cope with these conditions. The successful pilot program launched by the Rockefeller Foundation, together with the Ente Regionale per la Lotta Anti-Anofelica in Sardegna (ERLAAS) formed under the Italian public-health department, however, seems to have been successful. Begun in 1946 and ending in 1950, increases in productive manpower, gains in the psychological effect on the people, and the reclamation of several thousands of hectares of uncultivated or abandoned land have all been evidenced. The number of malaria cases declined from a high of 19,000 in September, 1946 to a high of 2,000 in July, 1948.

4. Peculiar Aspects of the Physical Environment. The limitations of the Mediteranean climate are so intensified in Sardinia as to make it resemble more desert like regions. The especially long, very dry period combines with the steppe land to give this impression. Two other factors combine to reduce moisture effectiveness: the soil and the winds. About 60% of the soils are impermeable, making for quick run-off of the sparse rain. Sardinia is very windy with the northwesterly mistral out of the European high pressure zone and the southern sirocco out of the Sahara. The latter controls the summer, but both winds reach the island very dry--increasing summer evaporation and lessening benefits of winter rains. Another characteristic is rough topograhy, which leaves little culti-

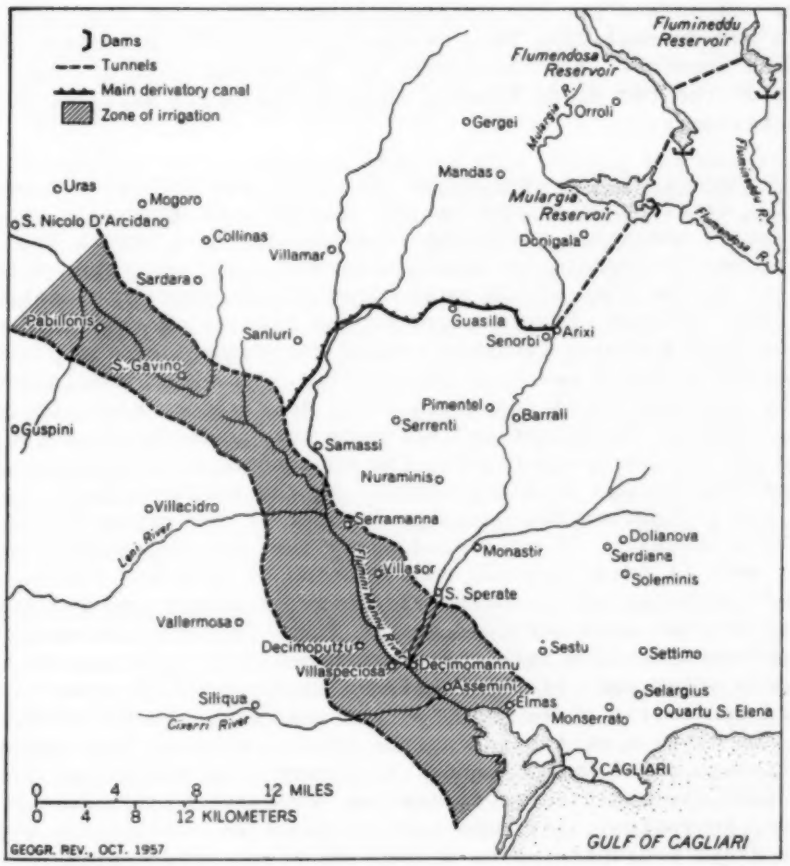


FIG. 4—Middle Flumendosa works and projected Campidano irrigation district.

ble land, with many parts suitable only for sheep raising. The only plain of any size in Sardinia is the Campidano, a tectonic trough which cuts diagonally across the southwestern part of the island; it is about 100 kilometers long and an average of 20 kilometers wide. Along with the rolling Sassari plateau to the north, the Campidano has the greatest potentiality for agricultural development. Malaria and dryness have been obstacles to such development, but now only the dryness remains. But this plain is the dryest part of the island. The "foehn" effect of the two winds blowing through the plain make for very low moisture effectiveness.

5. Early Development of the Campidano. The plan has virtually everything to recommend it for development except water. The soil is generally good; there is a high incidence of sunlight; unseasonably early and late frosts are rare; both railway and highway transportation facilities are good; and, even with its difficulties, it is the site of the most closely knit pattern of settlement on the island. (The villages, however, are on the fringes of the Plain--due apparently to the over-whelming tendency toward abandonment of the plains and retirement to the hills for a pastoral way of life.) Lack of population pressure has delayed the reclamation of the Plain until fairly recently. During the Facist period, several "bonification" projects were undertaken to achieve transformation of the Campidano Plain. The most successful efforts were those of land reclamation through drainage control in the northern Campidano. Here both drainage and irrigation was possible because of the proximity of the Tirso River, Sardinia's largest. It was noted early that the impermeability of the island's soils made it ideal for the construction of dams and reservoirs; and, for the multiple purposes of hydroelectric power, drainage and irrigation, two dams and two reservoirs were achieved on the Tirso in 1922. The area as far southward as Arborea-Terralba felt the great benefit of an irrigation canal system. The only other part of the Campidano Plain which is under irrigation is the southern extremity, where ground waters are used--though without modern pumping. But the problem of irrigating the great middle of the Campidano remains; for, although the Flumini Mannu, the Cixerri and the Cannas Rivers have been drained, they are useless for irrigation because of their insignificant combined volume, inconstant flow, and lack of damsites. Presently this middle section of the Plain concentrates on winter wheat and sheep raising, with much of the land left fallow for pasturage in the winter and idle in the summer.

6. The Middle Flumendosa Project. Only 25 kilometers across a mountainous divide from the parched middle Campidano lies the Flumendosa River. A major stream rising in an area of maximum annual precipitation, and having a catchment basin of about 2,000 square kilometers, this river has one of the most substantial and uniform flows to be found on the island. The potentialities of this river for hydroelectric and irrigation development have been recognized since the "Flumendosa Plan" was initiated in 1928. Only after the War, however, was initiative taken for its effectuation. Private enterprise, the Società Electrica Sarda, completed a complex of dams, reservoirs and generating plants on the upper Flumendosa in 1949. Producing 130 million kilowatt-hours, this undertaking has become one of the most important in all Italy; and, combining with the power from the Tirso plant at the Villasor substation, it has important implications for the Campidano. Presently, however, very little irrigation benefits can result from development of the Flumendosa River. Since the late 1930's it has been recognized that it would be possible to divert the waters of the Flumendosa for the irrigation of the Campidano, for the provision of potable water to the city of Cagliari and towns of the Plain, and the supplementation of hydroelectric power where needed. This problem was approached concretely in 1946.

Dozier, Craig L. Establishing a framework for development in Sardinia -3

Financing for such project became feasible through the Cassa per il Mezzogiorno at the same time malaria was being overcome. The project is described as follows:

> "The plan for the utilization of the Middle Flumendosa waters called for the construction of three dams and reservoirs, the excavation of tunnels to convey the waters across the divide, and the digging of a main canal to carry the water through the low hill land bordering the Campidano in the east to the plain proper, whence it would be taken to all parts of the plain by a network of distributary canals..."

In all, 25 kilometers of excavation through solid rocks was undertaken; but in 1955 the tunnel from the Flumendosa to the basin of the Mulargia tributary (6 kms) had been completed, and that between the Mulargia basin to the edge of the Campidano was within 3 Kms of completion. At the eastermost flatlands of Campidano beyond Sanluri, an Experimental Farm has been established to show what irrigation can do. The project, which was scheduled for completion by the end of 1957, through the construction of the three modern arc-gravity-type dams, will impound the waters of the Flumendosa and two of its tributaries (Mulargia and Fludineddu) to a total capacity of 405 million cubic meters. The excavation of 25 kms. of tunnels and a network of distributary canals totaling 1,000 kms, the irrigation of some 50,000 hectares, the provision of potable water supplies to 22 communes of a combined population of nearly 100,000 (besides the provision of 10 million cubic meters of potable water annually to the city of Cagliari), and the hydro-electric production of 125 million kilowatt-hours per year--all are involved in this important project.

7. Significance and Prospects for the Future. The Campidano, when these extensive developments are completed, is expected to assume its rightful role as the most productive region of Sardinia. Substantial population increases are projected; and agriculture, given a dependable water supply, may take many directions. While sheep and cattle raising will continue to be dominant in Sardinian economy, the size and quality of herds and flocks will improve. Accordingly, we may expect an increase in the production of pecorino romano and provolone cheeses, which are also very important to the economy of the island. Sugar beets will probably be a significant addition to the irrigated Campidano, for nearly all conditions necessary for the successful cultivation of this cash crop are present. And Italy's need of increased domestic sugar production indicates favorable demand. The expanding fruit acreage of Sardinia would tend to locate largely in an irrigated Campidano too-especially apricots, peaches and plums, and in the south citrus fruits. Another significant development will be the acceleration of growth in Cagliari as the Plain it serves begins to benefit from irrigation. The southern part of the Campidano, in fact, will probably be the garden for this city. One problem, however, is seen to be that of the land tenure pattern. But it is felt that only by intensification of agricultural activity through irrigation can the problem of small holdings be dealt with. Increased production, capital formation, and continued improvement of the land are expected; and irrigation will make even the small holdings better off than under the old conditions of extensive wheat-livestock usage. Certain social adjustments are seen as necessary for full benefits to the island as a whole, and planning for such action is under way. Its aim is to "valorize the individual and his family on a decent economic base, rather than to create enormous collective units of land transformation." The symbol of determination behind this project, and the promise seen has been expressed as:

> "Non una goccia d'acqua al mare, se prima non abbia fecondata la terra."
> ("Not a drop of water to the sea until it has first enriched the land.")

C.I.J.O.

Holford, William
BRASILIA
Architectural Reviw, 122:731, December 1957, pp. 394-402. (Illustrations)
711.432 (81)

1. This is a closer view of Brazil's new capital which was briefly reviewed in Ekistics HIB-GA 27, December 1957. Sir William Holford was a member of the jury which selected the pilot plan of Lucio Costa, and here gives some of his impressions. Also the complete text of Costa's report is given in English.

2. The reasons for the new capital being undertaken are reviewed, along with a resumé of developments in Brazilian architecture since the 1930's. The spirit recently developed in the new movement was subject mainly to internal discipline, and 'planning' was suspect as an administrative device for promoting competition among architects. Police powers of planning have been seen as something to be circumvented. The result has been an uneven development between town and countryside. But with the project for the new capital:

> "Now, suddenly, the creative discipline of the architect is to be invoked on an enormous scale. Brazil is confident that an entirely new town, an administrative and federal capital, can emerge, fully appointed, from the designer's brain and become a metropolis within one generation."

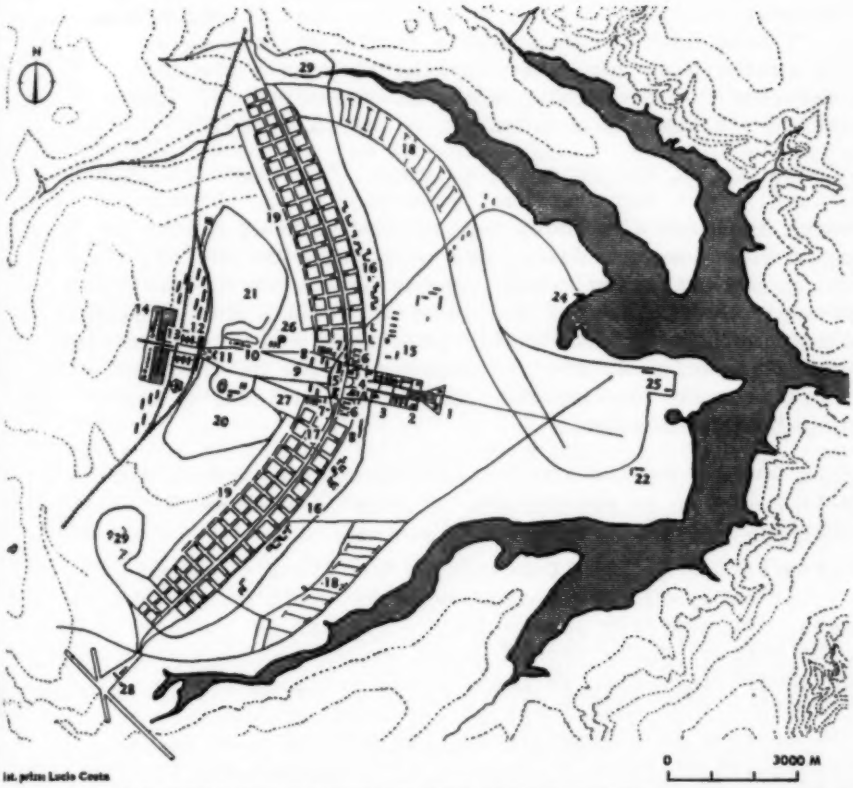
There is not much to be learned from precedents in deciding whether or not this is possible. With the exception of Chandigarh, post war planning of new towns has had target populations of from 20,000 to 80,000. And the British new towns are in no sense metropolitian or regional centres in their own rights.

3. The problem of President Juscelino Kubitschek was "to hitch all practical machinery, and the state and private investment required for a new town, to an ideal plan on an unprecedented scale." Preliminary work on site selection was done, and Oscar Niemeyer was commissioned to build two buildings. The President also asked Niemeyer to make sketch plans for the layout of the capital; but the architect advised him and Israel Pinheiro (head of the Development Corporation set up to build the capital) to hold a preliminary competition for ideas. Thus "administrative pressure was deliberately held back to enable an architectural idea of the form and character of the New Capital to be born first."

4. Oscar Niemeyer became Director of the Department of Architecture and Urbanism to the Capital Development Corporation and thus one of the national assessors of the competition for a Pilot Plan. The conditions for the competition were simple, and each competitor was asked to submit only:

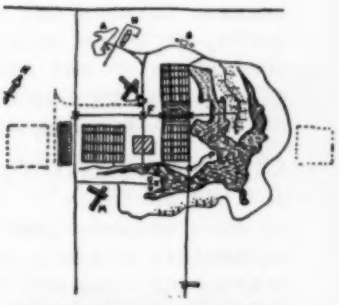
> a. 'A basic layout of the city, indicating the position of the main items of the urban structure, the location and interconnexion of the various sectors, centres, installation and services, the distribution of the open spaces and lines of communication, to the scale of 1:25,000.
>
> b. A supporting report.'

The jury had Sr. Pinheiro, President of the Development Corporation, as non-voting chairman, a representative from the Institute of Architects of Brazil, a representative from the Society of Engineers, two representatives from the town planning department of the Development Corporation (Oscar Niemeyer and Stamo Papadaki) and two European town planners (André Sive of Paris and Holford of London).

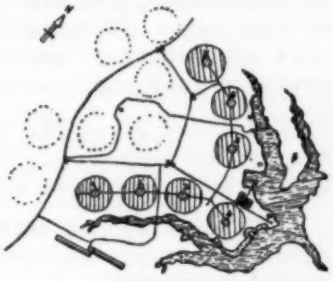


1st prize: Lucio Costa

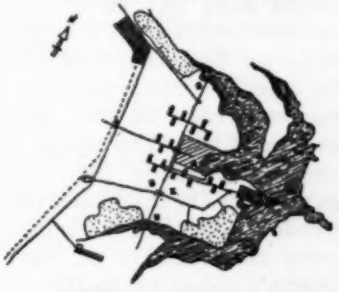
1, parliament. 2, ministries. 3, cathedral. 4, cultural area. 5, recreation centre. 6, banks and offices. 7, commercial area. 8, hotels. 9, radio and television centre. 10, stadium. 11, town square. 12, private dwellings. 13, railway station. 14, craftsmen and small industries. 15, universities. 16, embassies and legations. 17, residential zone. 18, detached houses. 19, gardens. 20, botanical garden. 21, zoo. 22, golf club. 24, yacht club. 25, residential area. 26, bus station. 27, site for fairs, circuses, etc. 28, airport. 29, cemetery.



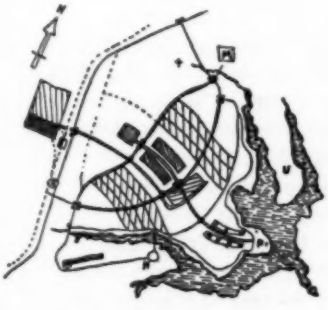
2nd prize: Baruch Milman, José Henrique Rocha and Hey F. Gonçalves.



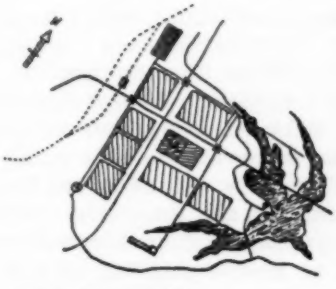
joint 3rd and 4th prize: M. M. M. Roberto.



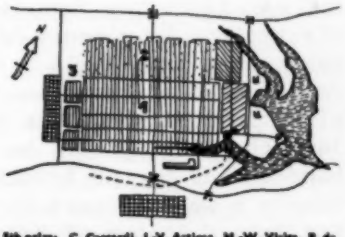
joint 3rd and 4th prize: Rino Levi, R. Cerqueira and L.-R. Carvalho Franco.



5th prize: Henrique Mindlin and Giancarlo Palanti.



5th prize: Construtecnica SA.



5th prize: C. Cascardi, J.-V. Artigas, H.-W. Vieira, P. de Camargo and Almeida.

5. The activities of the jury were involved from the beginning in discussions with press, the public, competitors and officials--even during the period of judgement. The two foreign members of the jury, it developed, were being asked to "tip the balance in favour of one scheme as against another." The choice was seen to lie between breadth and depth. The most fully worked out scheme was that of M.M.M. Roberto, of which Holford says: "I have never seen anywhere in the world a more comprehensive and thoroughgoing master-plan for a new capital city on a cleared site." But he finally concluded that "...everything about it was worthy of admiration, except its main objective. It was not an Idea for a capital city."

6. The submission of Lucio Costa was at the opposite extreme. "Here was an Idea and the skeleton of a metropolitan form-- and practically nothing else. Presented on five medium-sized cards (which included the short report) and without a line of mechanical drawing, no models, no land-use schedules, and no population charts, the entry went some way to justifying the criticism...that it was hardly worth consideration by a serious jury." However, the quality of the ideas expressed, the economy of expression, yet the fulfillment of essentials finally gave this entry the decision of the jury. (The decision was not unanimous, for the representative of the Institute of Architects wanted all premiums devided equally among the ten leading competitors--and that Costa's entry be disqualified.)

7. Holford gives the following background information "to enable those who have not had an opportunity of visiting Brazil to appreciate the significance of one of the most important civic competitions of recent times."

"The 'city' or building area of the Federal District in the State of Goias is about 150 square kilometers... It is 3,000 feet above sea level, with an average annual temperature of 67 degrees, low humidity and no frost. It has an invigorating air; and as I stood on the gently rising ground whose centre and high point is now marked by a tall wooden cross (and which in Lucio Costa's scheme is the site of the Radio-Television Tower) I felt that I was on the crown of the world. On the horizon, through the 360 degrees of circumference, one can see blue hills. On two sides of the roughly triangular site are converging rivers which are to be dammed at the apex, making a head of water for initial hydro-electric generation, and a permanent lake of about 40 square kilometers. The rock is low enough to give excellent foundations for big structures but not high enough to make underground services expensive. Trees, once supplied with water on this kind of terrain grow three times as fast as in England and there is nothing impossible in Lucio Costa's idea of marking out neighbourhood units or building groups into squares, bordered by belts of trees and service roads, before building development takes place. The Sao Francisco River, not very far from the site, is the spine of an enormous regional development scheme, including power generation, mineral extraction and manufacturing industry and will in time be made navigable right down to the sea. Air traffic is already highly developed in Brazil, and in Goias I found more air-taxis than land-taxis. A runway and airport of international dimension is already constructed at Brasilia, and there will be civil and military airports and air clubs in addition. The highway from Anapolis is now being improved and before long the railway will be extended from the existing railhead. (The railways, handed over by the British at the end of the war, are obviously inadequate, and remain a weak feature in the development of Brazil's resources. The population of the United States of Brazil, which at the beginning of the century was 18 million, is now virtually the same as that of the United Kingdom and is expected to reach 250 million by the end of the century. The number of civil servants per 1,000 population has now reached a peak of 4.3 and will probably decline. Nevertheless the statiticians estimate that the proportion living in the Federal Capital in 1980 will be near that of the USA--about 12 per cent of American officials live in Washington. This means approximately 40,000 officials in Brasilia by 1980, each with an average of four dependents, always provided that the dwellings are ready for them... The Federal Government, who own all the land, will build on some of it, lease some and, in order to increase initial capital, sell some under covenant to private enterprise, housing co-operatives and approved development agencies."

I.J.O.

Costa, Lúcio
PRIZEWINNING REPORT ON BRASILIA
in Holford, William. "Brasilia," Architectural Review, 122:731, Dec. 1957. p. 309. (Illustrations.)
711.432 (81)

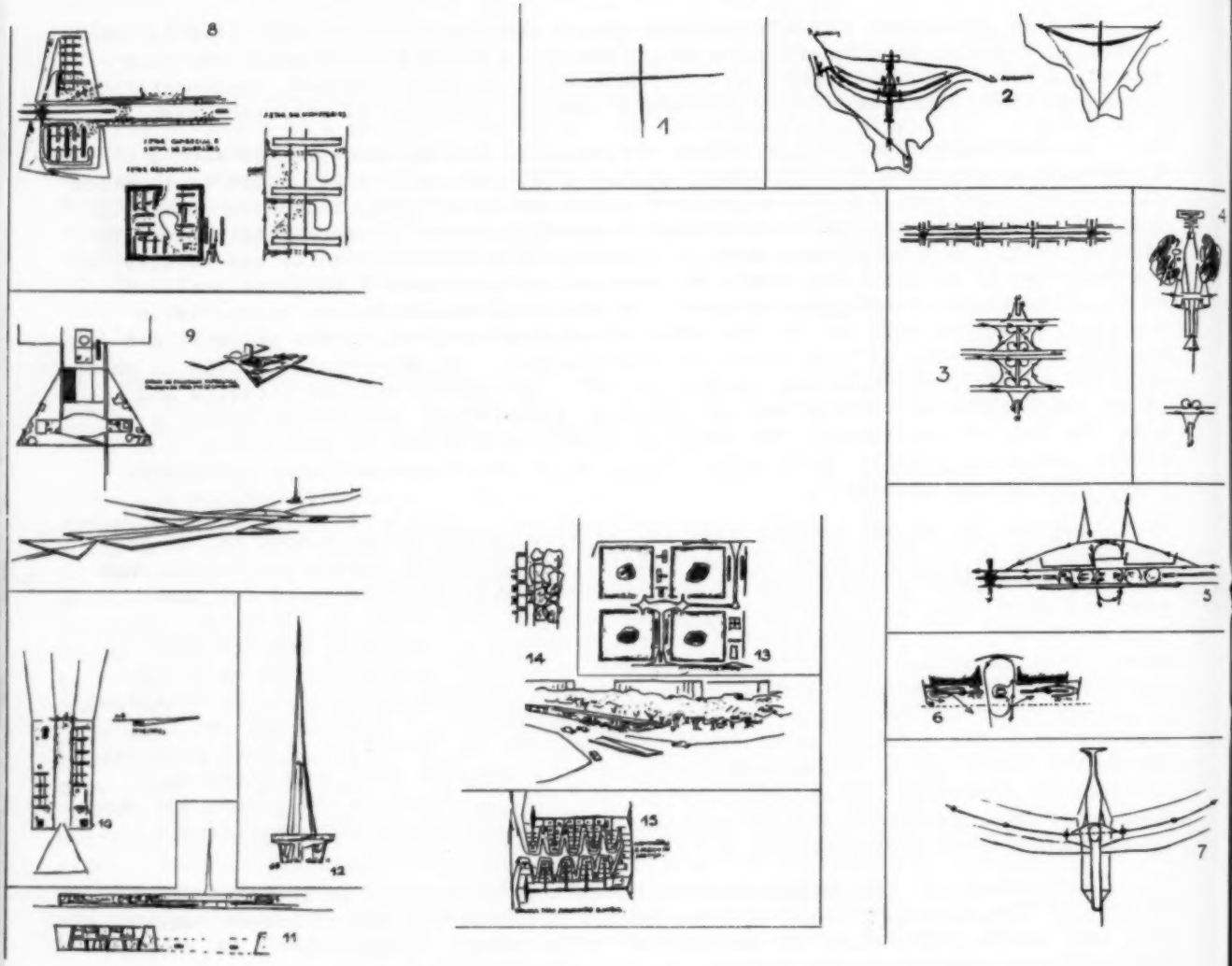
1. This is the report and accompanying sketch designs which, as described in the preceding article, won the national competion for a Pilot Plan to guide the development of Brasil's new inland capital. We present certain selected, representative passages. Next month we hope to include a reasoned critique of this same plan.

2. "...Each competitor is, in effect, being asked how he conceives of such a city. It should be conceived of, I believe, not as a mere organic entity, able to function effortlessly and vitally like any modern town; not as an urbs, therefore, but as a civitas, having the virtues and attributes appropriate to a true capital city. To achieve this, the town planner must be imbued with a certain dignity and nobility of purpose--for it is from this basic attitude of his that must spring the sense of order, fitness and proportion which will confer real monumentality on his urban scheme. I use the word not in the sense of ostentation, but as the palpable and conscious espression of true value and significance. He must design a city in which orderly and efficient work may be carried out: but also a city of vitality and charm, conductive to reverie and intellectual speculation, capable of becoming not only the seat of Government, the administrative headquarters of the nation, but also a centre of culture which will attract to it the finest and most perceptive intellects in the country."

3. "And now let us see how the plan was born, outlined and developed to its present conclusion. It was born of that initial gesture which anyone would make when pointing to a given place, or taking possession of it: the drawing of two axes crossing each other at right angles, in the sign of the Cross, I. This sign was then adapted to the topography, the natural drainage of the land, and the best possible orientation: the extremities of one axial line were curved so as to make the sign fit into the equilaterial triangle which outlines the area to be urbanized, 2. Finally, it was decided to apply the free principles of highway engineering, together with the elimination of road junctions--to the technique to town planning. The curved axis, which corresponds to the natural approach road, was given the function of a through radial artery, with fast traffic lanes in the centre and side lanes for local traffic. And the residential district of the city was largely located along this radial artery, 3."

4. "As a result of this concentration of the city's housing, it seemed logical to dispose of the other important centres along the transverse radial artery, which thus came to be regarded as the monumental radial artery. Here, then, are located the Civic and Administrative Centres, the Cultural Buildings, the Barracks and the zones designated for warehousing and supply, local light industries and the railway station, 4. At the intersection of the two arteries, but functioning essentially as part of the organization of the monumental radial artery, are the banks, the finance corporations, big business buildings and offices housing the liberal progessions as well as extensive markets and shopping centres. Since the monumental radial artery underpasses the residential radial road, it was necessary to create a spacious platform to be kept free of all traffic not specifically intending to park there. The quiet refuge of this platform makes it the logical site for the Entertainment Centre..., 5."

5. "...The 'under-platform' will also house a large car-park and here too is the Interurban Transport Centre--a building reached by passengers from the upper platform, 6. ... An independent and secondary traffic system has been worked out for heavy vehicular traffic; it has crossings marked by traffic lights, but does not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Costa, Lúcio. Prizewinning report on Brasilia -2

communicate with the first system except beyond the Sports Center. It has basement level access to buildings in the Shopping Centre at a lower than ground level, with approach galleries tunnelled through the terraced embankment, 7. Once a general network for motorized traffic had been established, an independent grid of safe-transit footpaths for pedestrians had to be organized, 8. However, separation of the systems of circulation must not be taken to unnatural extremes... Indeed, Man and Motor must be kept apart, although one must never lose sight of the fact that, under proper conditions and for mutual convenience, co-existence is essential.

6. "The highlights in the outline plan of the city are the public buildings which house the Fundamental Powers. These are three, and they are autonomous: therefore the equilateral triangle--associated with the very earliest architecture in the world--is the elementary frame best suited to express them. For this purpose, a triangular, terraced embankment (terreplein) was designed: it will be supported on retaining walls of rough stone rising above the surrounding countryside, and can be reached from the ramp of the autostrada running between the President's Residence and the airport. At each angle of the triangular piazza--the Place of the Three Powers, as it might be called--stands one of the three buildings: The Government Palace and the Supreme Court at the base; the Congress Building at the tip. This building also fronts on to a wide esplanade on a second rectangular embankment on a higher level, according to the local topography: the entire perimeter of this embankment is also supported on walls of unfaced stone. To transfer to present-day usage the ancient technique of the terreplein lends a certain harmony to the pattern and creates an unexpected and monumental strength, 9. This esplanade-- the Mall as it would be called in England-- is lined by a wide grass verge used by pedestrians and also for parades and processions; onto it front the Ministries and the Offices belonging to the Public Authorities, 10."

7. "Along the Mall, space has also been allocated for the Cathedral, but this will face its own piazza, not so much for reasons of protocol, since in Brazil the Church is separated from the State, but more because of the question of human scale and the need to give this building its monumental value. Another reason, even more important, is of an architectural nature: The Mall's perspective must be undisturbed up to a point beyond the central platform, where the two radial arteries cross each other. On this platform, as we have seen traffic is only local; and the Entertainment Centre--which has something in it of Piccadilly Circus, Times Square and the Champs Elysées-- is situated on it. The side of the platform which overhangs the Cultural Centre and the Mall will not be built over, with the exception of the Opera House and a tea-room, reached directly from the Entertainment Centre, or through a lower-level passage from the Cultural Centre. The front of the platform will be lined with cinemas and theatres, and with the same low height regulations, so that if viewed as a whole, they will make an uninterrupted architectural mass, with arcades, wide sidewalks, terraces and cafés. The facades of the buildings provide a fine field for illuminated advertisements, 11."

8. "The Sports Centre, with its extensive car-parks, is situated between the Municipal Square and the Radio-TV Tower. This tower is triangular and consists of a monumental base of unfaced reinforced concrete, stretching up to a studio and office floor, and of a metal superstructure with a look-out section halfway up, 12. On one side it overlooks the stadium and its pavilions, with the

Botanical Gardens behind them; on the other, it has a view of the racecourse, grandstands, stables and ancillary buildings and, adjacent to these, the Zoological Gardens. The two great green parks, symetrically laid out in relation to the monumental radial artery, are the 'lungs' of the new city, 4."

9. "As regards the problem of housing, the solution chosen was the arrangement of an uninterrupted sequence of super-blocks, in double or single rows, lining the residential radial artery, and with a wide green belt, densely planted with fall trees, round each super-block. Each one will give pride of place to one species of tree; the ground will be carpeted with grass, and shrups and follage will screen the internal grouping of the super-block from the spectator: who will get a view of the lay-out through a haze of greenery, 13. .....The shops have plate-glass display windows, and they form rows along pavements protected by built-out canopies. The face the wooded belts round the super-blocks that are only used by pedestrians, and also the belt on the opposite side of the road adjoining the accomodation road. They are interconnected by lands and alleys, so that they are really semi-detached, although if viewed as a whole they appear to form one single composition, 14. ...Provision is also being made for island sites surrounded by trees and parkland, to be acquired for individual houses..., 15."

D.H.I.M.

Henderson, Julia J.
URBANIZATION AND THE WORLD COMMUNITY
Annals of the American Academy of Political and Social Sciences, Nov. 1957.
(Special issue: "Metropolis in Ferment," edited by Martin Meyerson et al.)
pp. 147-155.
711.13 (100)

1. This article represents in summary the relevant findings of the research staff of the United Nations Bureau of Social Affairs concerning urbanization in the less-developed regions of the world. Some of Miss Henderson's own reflections on the implications of these findings for future developments are also given.

2. Urbanization is defined as the "process whereby an increasing proportion of a country's population lives in urban localities." Concentrations of 20,000 or more are considered urban localities. The narrower definitions were chosen because populations in transition appear to suffer most acutely the effects of of rapid social change. While the discussion emphasizes problems concurrent to urbanization, no effort is made to judge whether urbanization is good or evil. "What seems sure is that the process of urbanization is not likely to be reversed in our generation and that it is a part of a larger process of economic and social change which is affecting the countryside as well as the city.

3. Demographic Aspects of Urbanization. Following the studies of Kingsley Davis, it is pointed out that the rate of urban growth has been accelerating since 1800. The population living in cities of more than 100,000 population has increased between 1900 and 1950 by 444% in Asia and 629% in Africa. (But in Asia, for example, the percentage of total population living in cities has increased only from 2.1% to 7.5% in the fifty year period.) Variations in the percentage of population living in localities of 20,000 or more are marked even within regions: e.g. 8% in Pakistan vs. 42% in Japan and 15% in Turkey vs. 29% in Egypt. One interesting feature is the comparison between rates of urbanization in the more industrialized countries and those in the less-developed lands. France, the United States, England and Wales all showed either a slowing down or an actual regression in rate of central urbanization: partly due to suburbanization resulting from improved transportation and central city congestion. Puerto Rico and the USSR have in the same period shown a remarkable increase in urbanization; and India and Malaya seem to be entering an initial stage of acceleration. Two demographic observations of general social significance are made:

a. North America, Europe, Oceania and Latin America, females predominate over males in the urban areas; but in Asia and Africa the opposite is true.

b. In all regions, cities have fewer persons under 15 years of age in relation to the productive age groups than do the rural areas.

4. Urbanization and Economic Development. Rapid urbanization in many countries is outstripping industrialization. This is contrary to the commonly-held view drawn from experience in many Western countries. A great many social and economic problems are tied to this phenomenon, and the imbalance leads on to say that Asia, Africa and Latin America are one sense "overurbanized." While the Western city has been a generator of economic development, many of the great cities in regions under study are economically parasitic. Many of these cities have been administrative, cultural and commercial centers, and have lived off the country. Presently the increase of trade in many of these centers is more

related to the economic development of the industrialized countries than to the economic development of their own nation. Often such cities will have consumption patterns similar to those in western cities, but quite in contrast to those in surrounding territories. Today, however, there are persons in key administrative and economic posts in governments of these countries who see clearly the implications of these facts and the importance of planning for balanced development of the rural and urban areas. An important related question is that of training workers for development. As women and children are an essential part of the urbanization, orientation of migrants becomes a necessity.

5. Effects of Urbanization on Housing and Health. A conclusion of the United Nations Report on the World Social Situation of 1957 is that the housing situation has probably deteriorated during the past five years in much of the world. Population growth and urbanization have accounted for this. Shanty towns in the Middle East, slums surrounding most of the Asian cities, the "favelas" of Rio de Janeiro and people sleeping in Calcutta streets all point up the housing problems of urbanization in our day. The city with three distinct zones is found in many such areas:

a. A modern commercial and upper class area

b. The old city with its narrow streets and winding stairways

c. A peripheral city of huts and shacks made of inferior materials.

This pattern is so widely found that it has come to be felt that measures for better housing as well as better town planning must play an important role in coping with the problems of urbanization. The United Nations has reached no conclusions on the best methods for dealing with this problem. Self-help housing is being stressed for some countries even in urban areas, for it seems that public construction cannot keep pace with urbanization. Prior to the Twentieth Century migrants to cities were worse off in terms of health than people living in rural areas, but now the health of the inhabitants of major cities is often better than that of the country as a whole. This is despite the fact that some diseases of the countryside (such as trachoma and malaria) are being transferred to city populations and the fact that some diseases (such as pneumonia and venereal diseases) are more prevalent in urban areas. Nutrition trends appear conflicting: While better education on the subject is certainly better in urban areas, people may find it more difficult to obtain food stuffs--and thus be worse off nutritionally after migration.

6. Urbanization and Family Life. The extended family seems to be giving away to the smaller two-generation family--if only as a very general tendency. But there is considerable question as to whether the family structure itself is actually weakening. In Japan, for example, the divorce rate actually declined during a period of rapid urbanization and industrialization. And the maintenance of kinship ties during urbanization in parts of Africa is noted. But the migration of young men to the city is clearly disruptive when the women and children are left behind. The change of welfare activities from the extended family to official services indicates a change in the function of the family. All members of the family are affected by this, but especially the status of women. Whether the net result will be an improvement in the woman's status is still in doubt. No clear generalization is made for the

children; but educational advantages on the one hand are contrasted to cramped space, child labor and juvenile delinquency. The special role of the father is described in terms of the pattern of migration. In many cases urbanization is seen to entail a loss of parential and family authority (especially if his wife or children work), a general loss of prestige among associates (relative to that held in the tribal or village situation), and a lack of social security.

7. Since many of the problems are best described on a regional basis, short summaries are given for Africa, Asia, the Middle East and Latin America. For the Middle East, the historical contrast between city and countryside are brought out. While the cities have constantly been exposed to outside influence, the rural villages and nomadic tribes have remained resistant to change. But this is now breaking down through urbanization. The transition to urban life may be less traumatic here since in most countries there is the common religion--Islam--and a common language--Arabic. Also family structures seem adaptable; and (except for the oil fields) urban enterprises continue to be closer to the handicraft level than to modern industry.

8. Looking into the future, it is expected that urbanization will continue in the less-developed countries (as elsewhere) for an indefinite period. The growth of economic, social and physical planning is looked to with hope. But the social welfare of urban in-migrants is not seen so optimistically.

A.D.N.O.W.

Horsbrugh, Patrick
'OMNITECTURE': THE PRACTICE OF ENVIRONMENTAL CONTROL
The Journal of the B. Sc. (Estate Management) Club, 1:5, Nov. 1957. pp. 101-108.
711.1 (100)

1. This is a bold essay on the need for 'super-planners' to control the environment in a world where land becomes ever more scarce. Mr. Horsbrugh's activities range from Pakistan to Canada and the United States, as well as England. The present article was derived from lecture material prepared while he was a visiting professor at the University of North Carolina (USA). The author feels that the present suggestions are only one of the ways to achieve environmental control; others , such as teams of specialists, are also being organized by Mr. Horsbrugh.

2. The growing crisis resulting from land wastage and misuse throughout the 'free' (and perhaps also the 'unfree') world has generally not been noticed or appreciated sufficiently. Major conflicts in land use have remained secondary to political expediency, and the resulting frequency of crises follow from this. Thus anyone engaged professionally in urban landscape (any part of the tapestry of land and buildings) has the dual duty of meeting the client's requirements plus exercising guardianship of land values. The projected increase of world population from 2,700 million to some 4,000 million by the turn of the century is described. Difficulties in sustaining this population will be many, and the time factor works against us. The intelligent use of the remaining land is the only possible way, for land seems to be going out of production at least as fast as new areas are opened. Increasing urbanization further complicates the problem. And while worthwhile efforts already dispel dispair, complaisance is an ever-present danger.

3. The vital issue with which this article is immediately concerned is this: Where is the technical leadership now required for large territorial development to come from? Many professions are already involved, and more are expected with increased technical specialisation; but specialisation is no panacea, even for current difficulties, still less to cope with demands to come. A danger of over-specialisation is a competitive attitude between experts leading to layman decisions. Therefore, the advances in specialisation must be paralleled by the cultivation of an increasing number of:

> "individuals who, after the normal basic training in Landscape Design, Town Planning, Architecture or Estate Management can continue to absorb such geographical, economic, and ecological training as will enable them to act as co-ordinators and to exercise an informed and balanced judgment and influence amid the conflicting claims now being made for every acre."

Shape and disposition are required even for economic planning at the broadest scale; so physical design is inescapable, and the necessary 'master-minds' should possess a strong sense of design. It is felt that the four professions mentioned are "most likely to provide personnel of special skill and team potential capable of an integrated understanding of industrial, commercial, agricultural and social forces which are at present so often in opposition." Landscape Design is given a special place, for the pressures now in operation make it impossible to successfully tackle physical planning on less than a landscape scale--whether parochial, regional, national or sub-continental. Town Planning, Architecture and Estate Management are seen as specialised areas of the landscape. But this relationship has not been recognised by schools

where City Planning is secondary to Architecture and where Landscape study is only a fringe discipline. To deal with the broader demands of planning today, educators will need to make a fresh attack. It is little less than criminal for a planner to tamper with the earth's surface (which he must) without humility and a determination to understand the short- and long-term consequence of his actions.

4. The great need in educational establishments now providing courses in the basic subjects is the selection and development (not training) of 'master-minds' so that they may accept responsibilities in co-ordinating specialists in territorial development. The more complex problems of population increase, improved communications and increasing mechanisation requires more thoughtful planning on broader intellectual and territorial bases than has been possible. Nothing less than a 'planning super-intellect' appears to be required, and while such men are certainly rare, they do exist. And universities must accept the direct responsability for preparing students and post-graduates for these super-planning duties as urgently as for positions at the head of industrial activities.

5. The creation of such planning controllers will be a major undertaking and will require a campaign to show how vital such persons have already become. Also a new descriptive name and supporting vocabulary will be needed since none of the current works (as 'planner' or 'architect') really conveys the full meaning and responsibilities involved.

> "It is suggested that the required individual, (and it is individuals who are needed, for an independence of mind is the first requisite in such a person) might be described as an OMNITECT, responsible for environment, OMNITECTURE, and for OMNITECTURAL design and control in every detail."

Environmental control implies a sensitivity in matters of design, and the course of study is conceived as post-graduate to one of the design studies. But to this prerequisite must be added some practical experience, and proof of a basic understanding of some branches of political science, economics, geophysics or kindred subjects. Selection of students will have to depend solely on individual merit, on background and upon intention. The resulting stamp of approval should be MASTER OF OMNITECTURE and could be achieved only on the merit of personal activities and written theses appearing in published form--perhaps in a series of magazine-like annual reports. It is conceived that the degree would carry the name of the university; e.g. London Master of Omnitecture. The enlistment of cooperation from other elements, such as the larger mineral and industrial organisations of the free world, is seen as a way to extend the programmes beyond the universities. Financial support from foundations and trusts is also envisioned.

6. Because of risk factors in the establishment of such programmes, it suggested that the following possibilities might be explored by those convinced of the need for Omnitecture:

> a. That several of the internationally renowned foundations which have already demonstrated their concern with territorial development be approached, and asked to contribute a set sum for a limited period, so that an organisation can be established, to declare its intentions, and to recruit staff and students for an experimental period.

b. That an appropriate university or universities with fully developed departments of landscape planning, civic design and architecture be asked to co-operate for the same period, and to provide accommodation and services.

c. At the end of the period, the whole programme should be reviewed. If the initial proposals appear to be justified, the prospects good, and the response effective, the organisation could then become officially recognised and accepted and established as a regular university department.

d. At this time, also, the financing foundation or the supporting organisations would have the opportunity of withdrawing from or contributing for a further period.

d. It would seem appropriate to invite the co-operation of the major industrial concerns which develop natural resources, such as the oil companies, aluminium and other mineral working corporations, so that they might contribute staff on a temporary basis, as well as sending their own personnel to take the course.

7. The length of successive courses would vary according to the particular programme, and the amount of travel involved (as well as the programme) would be different with each course. It could then be related to some particular field-work either contemplated or in progress, thus giving reality to each course as an alternative to instruction work being based on a series of hypothetical problems. The number and variety of subjects to be covered would also vary with the principal task at hand, and the instructors available, but generally they would include "those subjects directly related to Landscape comprehension, such as geology, ecology, meteorology, water and soil conservation, as well as geophysical and other surveys, sociology and local histories."

8. A programme of this kind for the development of Omnitecture is thought worthy of every country facing economic changes or expansion of population and natural resources; for it is an insurance against wastage and an investment for improved environmental control. An Onmitectural department is seen as hardly less vital for the larger industries and the many international assistance organisations that for the requirements of national governments. Concerning academic prestige it is said that:

"The first university to develop such a programme, embracing environmental design in the broadest possible way, would at once establish its pre-eminence in the field of planning and assume the leadership in the professional subdivisions of Landscape, Town Planning, Architecture and Estate Management, in the most effective terms."

9. "Omnitecture depends, however, firstly upon the recognition of the fact of land scarcity and the consequent impoverishments which now confront us, and secondly, the recognition by Authority at every level that Landscape comprehension and design demands today a prime position in our educational fabric by obvious right. Given such recognition, Omnitecture, the science and art of environment control will become possible. The need is urgent."

D.H.M.O.

United Nations, Department of Public Information, Press and Publications Div.
COMPLETION OF MEKONG FIELD SURVEY
Press Release TA/693, 10 January 1958.
711.2 (59)

1. This release was based on a statement made in Bangkok, Thailand by Lt. Gen. Raymond A. Wheeler, Chairman of the United Nations survey mission for the Lower Mekong River basin in Southeast Asia. Selected extracts follow:

2. "The United Nations survey mission for development of the Lower Mekong River has now completed its field survey and inspection of the Lower Mekong by airplane, motorcar and boat from Luang Prabang (Laos) to the South China Sea. Important sites along the river that had been considered in previous studies were visited... In addition, members of the mission participated in lengthy discussions with officials and technicians of the four riparian countries (Cambodia, Laos, Thailand and Vietnam). .....The assistance and cooperation given to the mission by representatives of the four countries were very helpful. This international cooperation of Cambodia, Laos, Thailand and Vietnam is most encouraging and will assure development of the water resources of this great river."

3. "The mission is now working on the draft of its report, which it hopes to be able to complete by 20 January. .....The Mekong is one of the major rivers of the world and is a majestic river with great potentialities for service to Southeast Asia in fields of navigation, development of hydroelectric power, and related water uses. Control of its floods and improvement of drainage can be accomplished with reasonable works and in most instances in connection with its development for the useful purposes of navigation, irrigation and power. Wise utilization of its waters will contribute more toward improving human welfare in the area than any other single undertaking.

4. "To undertake these works requires adequate planning, and planning can be adequate only when sufficient and reliable basic data are available. All of the existing reports that were reviewed by the mission stress the dearth of reliable basic data, and investigations by the mission with officials of the four riparian countries confirm this situation. Consequently, I feel sure that the mission will point out this need and recommend appropriate action that should be taken immediately. It is obvious, of course, that collection of the basic data required should be initiated and concentrated in localities where it appears that worthwhile projects may be developed. Outside assistance in provision of material, equipment and services will be required. .....Our report to the United Nations will include details regarding the cost and time required. .....Members of the mission...were impressed with the cooperative spirit and technical competence of the men we met and are thankful for opportunities of becoming acquainted with them. We will always have a sincere and continuing interest in development of the Mekong River basin."

5. At a press conference held in Bangkok the day of the release, Gen. Wheeler said that the Mekong was probably one of the greatest still-undeveloped natural resources in all Southeast Asia. Included in potentialities were such specific benefits that Thailand, for example, might obtain from a comprehensive development program--notably for its northeast provinces where recurring drought conditions could be overcome by irrigation schemes. The work of the mission was technical, not political, it was stressed; and certain technical conflicts will be elaborated in the report. But from a broad political viewpoint, the present cooperation of the four riparian countries in asking for a United Nations survey and in looking ahead toward the ultimate development of the great river was said to be one of the important political developments in the harnessing of international rivers known to the speaker.

GENERAL

A.D.H.R.

Geiger, Theodore
ENTERPRISE AND INCENTIVES IN TROPICAL AFRICA
Looking Ahead (National Planning Association), Jan. 1958, Vol. 5, No. 10.
331 ; 332 (66) (67)

1. This is a report on tropical Africa ("the region south of the Sahara and north of the Union of South Africa") from the businessman's point of view. Mr. Geiger, Chief of International Studies for the National Planning Association, has recently traveled extensively in both West Africa and East Africa.

2. The increased interest in tropical Africa--including American efforts to promote political progress and economic growth through financial aid, technical assistance and the encouragement of private investment--are described. But the success of these efforts will depend considerably on "what the Africans are willing and able to do for themselves." The evolution of indigenous enterprise must match and eventually surpass the activities of foreign capital.

3. The persistence of the economic pattern whereby probably no more than 10% of the total population is engaged in any way in the market economy is contrasted to most other underdeveloped countries. Another complication is that "in an entrepreneurial, managerial and financial sense, the market economy of tropical Africa is overwhelminghly the responsibility of non-Africans--principally Europeans, Indians, and Lebanese." The preponderence of foreign control becomes less and less tenable from the African point of view; and it may actually endanger the foreign investor himself, as well as the whole field of investment in tropical Africa. The barriers to the desired evolution of African enterprise are said to go beyond the familiar ones, such as shortage of indigenous capital and lack of technical and managerial skills. "A more basic problem is the nature of motivations in existing African society."

4. The "rudimentary character of economic motivations at all levels of African society" is said to be striking. Even those involved in the market economy see the aim of economic activity as the provision of food, clothing and shelter --"with the minimum effort and interference with more highly prized noneconomic activities." And those who have developed economic asperations are mainly interested in consumption--usually conspicuous consumption--rather than in capital accumulation and investment in productive enterprise. Even those Africans who have been educated in Europe or America are more interested in politics, government service or the liberal professions than in the active running of a business or a commercial farm.

> "Most African leaders are passionately devoted to the economic development of their countries, but by and large they want to be the political administrators or professional planners of the process, not the risk-takers or the day-to-day managers of productive enterprises."

Thus at all levels of the society of tropical Africa, most individuals have only a very limited personal commitment to productive economic activity. This is in contrast to the attitudes of farmers, workers and managers in the industrialized West. Very few Africans "regard productive work as their vocation --as the particular human activity in which to strive with greatest vigor to develop their fullest potentialities, and by which their social worth and self-esteem are largely determined." While they may work hard at their jobs, non-economic activities usually command primary loyalty and attention. Such non-economic activities include participating in the immemorial and elaborate social political and religious life of the tribe or village; exchanging news, views and gossip; visiting relatives and friends near and far; attending native and

western entertainments; etc.

5. A product of this process is the African independence movement, but these new nations have no hope of survival in modern conditions without first increasing their productivity and national wealth. There is a relatively tiny but politically powerful group of educated and articulate African leaders, in whose minds the modernization and strenghthening of their countries are matters of personnal and racial pride--as well as of national welfare. So the real choice in tropical Africa at present is not that of fostering economic and social development vs. no change at all in African values and ways of living. Since Africa cannot be isolated from this modern world, profound economic and social changes are necessarily taking place. The only real choice is as to whether conscious efforts will be made to direct and to assist this process to take place, creatively and usefully; or whether, through inertia, expediency or short-sightedness, development would be allowed to occur haphazardly and with great human suffering and frustration.

> "The question of ends is thus intimately related to the problem of means, itself exceedingly difficult to solve. For, how can weak and subordinate economic motivations be intensified and developed without undue sacrifice of other valued aspirations and customs?"

6. A contrast between West and East Africa indicates that considerable achievements can be made in tropical Africa when the motivations of the Africans are more conducive to economic development. West Africa is probably more advanced in this respect than East or Central Africa. Agricultural activities in Ghana, Nigeria, Senegal and Liberia show more and more individuals who are becoming concerned about maximizing their output and minimizing their costs. Some accumulation of capital for investment in local transport activities and small industries, which are often conducted or managed by themselves is seen. Some areas where the Lebanese traders have not taken over, are said to indicate that Africans are becoming shopkeepers, merchants, and purveyors of services. Uganda, with the notable exception of the Chagga tribe, seems to show a lack of these tendencies. Cotton and coffee growers in this country are still content to restrict their acreage under cultivation and hours of work. And the few Baganda with comparatively large disposable incomes buy automobiles and consumer durable goods rather than investing in the extension of cultivation and the improvement of productivity. Only recently have the colonial governments adopted programs and allocated funds to stimulate and assist growth of African enterprise in agriculture, distribution, small manufacturing and local transportation. But the means available in the East African programs are far too limited for significant results--especially in the matter of trained personnel. But governmental policies, both "the carrot and the stick," can influence the kinds and rates of change in economic motivations. An example in tropical Africa has been the head and hut tax to create a need for some money income.

7. These kinds of pressures are expected to increase as more African countries become independent and African leaders try to obtain larger revenues to finance economic and social development and other purposes now being subsidized by colonial governments. "At the same time, the personal rewards of entrepreneurship will become more and more evident to Africans, and growing numbers of them will voluntarily seek to become commercial farmers, small manufacturers, merchants, and tradesmen." But the crucial moral and economic problem will be the increased use of incentive rather than force to guide economic and social development.

C.D.E.M.O

United Nations. Economic and Social Council, Statistical Commission
UN COMPENDIUM OF SOCIAL STATISTICS, 1963
E/CN.3/239, 6 January 1958.
312 (100)

1. This is the description of the projected compendium of social statistics to be used in conjunction with the 1963 Report on the World Social Situation. A detailed draft outline for the contents of the compendium is presented. In introducing this broad International Programme of Social Statisitcs, the definition and the scope of such data is explained; and its role in the formulation of social policies is brought out.

2. The following topics are "generally considered to fall within the scope of social statistics" in this and other United Nations Publications: Population and vital statistics, social stratification and social mobility, family and household structure, distribution of income and wealth, levels of living, health statistics, nutrition, housing, education and culture, conditions of work and employment, rural welfare, social security, child welfare, care and rehabilitation of physically handicapped, care of the aged and the destitute, social expenditure.

3. The Compendium itself will be made up of detailed tables arranged according to major topics. These main topics, by the agency which will be responsible for the particular subject, are as follows:

a. Population and Vital Statistics (including migration)--(UN)
b. Households and families--(UN)
c. Health conditions--(WHO)
d. Food production and nutrition--(FAO)
e. Housing--(UN)
f. Education--(UNESCO)
g. Nature and conditions of employment--(ILO)
h. Social security--(ILO)
i. Social defence--(UN)
j. Cultural activities--(UN/UNESCO)
k. Income and expenditure--(UN/ILO)
l. Social services--(UN)

4. Each of these categories is then broken down into several suggested tables of data. For example, Housing will have the following tables: (Note that definitions of statistical concepts will be those of "General Principles for a Housing Census," first draft, ST/STAT/P/L.22, 15 August 1956.)

Table 1 - "Housing units" and population (occupants) by type of "housing unit." Urban and rural. 1960. Numbers and percentages. (Type of "housing unit" is presently under active consideration for international classification, but the following types are tentatively suggested: "dwellings, " "collective house," "institutions," "mobile units," and "improvised housing units.")

Table 2 - Population occupants and "housing units" by type of housing unit and access to protected water supply. Urban and rural. 1960. Numbers and percentages. (Access to protected water supply:

a. with water piped, i. inside and ii. outside the housing unit, from a community-wide system for the distribution of water under pressure or from individual installations (pressure tanks, pumps, etc.)

United Nations. Economic and Social Council... UN compendium of social statistics, 1963.

b. without piped water)

Table 3 - Occupied "dwellings" with and without flush toilets. Urban and rural. 1960. Numbers and percentages. (Flush toilet: emptying into a community sewage system, septic tank or cesspool.)

Table 4 - Occupied dwellings with and without electricity. Urban and Rural. 1960. Numbers and percentages. (Either connected to a community wide network or to individual installations.)

5. Past preparation of the Report on the World Social Situation and studies concerned with the definition and measurement of levels of living have revealed the need for such a Compendium of Social Statistics. A wide range of statistical indicators which would reflect living conditions and levels and rates of social development is needed. The report envisioned would contain only significant statistics which are required for the analysis of the world social situation and its changes, referring to broad and important sectors of the national social structures. Due to problems of data collection, an annual report would seem to be impossible; but it is suggested that publication at four-year intervals might be considered.

E K I S T I C S

HOUSING & PLANNING ABSTRACTS

CLASSIFICATION SYSTEM USED BY DOXIADIS ASSOXIATES

A The Problems

B The Policies

C The Programs

D People, Development, and Ekistics**
- Geographic factors
- Social factors
- Industry
- Agriculture
- Transportation

E Houses

F Structures (exclusive of Houses)

G Community services
- Utilities and Social Services

H Regions

I Major urban centers

J Market towns
- Medium-sized and small towns
- New towns

K Villages
- Rural land

L Farms

M Surveys
- Census data
- Topographical surveys

N Research (and Technical Education)

O Planning (and Landscaping)

P Financing

Q Urban land

R Labor

S Materials

T Construction
- Systems of Building and Costs

U Implementation

V Management

W Administration

X Legislation

**Refers to centers of activities in relation to their surrounding regions.